DOCUMENT RESUME

ED 061 047 SE 013 285

TITLE	Toward a New Environmental Ethic.
INSTITUTION	Environmental Protection Agency, Washington, D. C.
PUB DATE	Sep 71
NOTE	56p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Administrative Agencies; *Agency Role; *Environment; *Federal Government; Natural Resources; Pamphlets; Preservation; *Program Descriptions
IDENTIFIERS	*Environmental Protection Agency

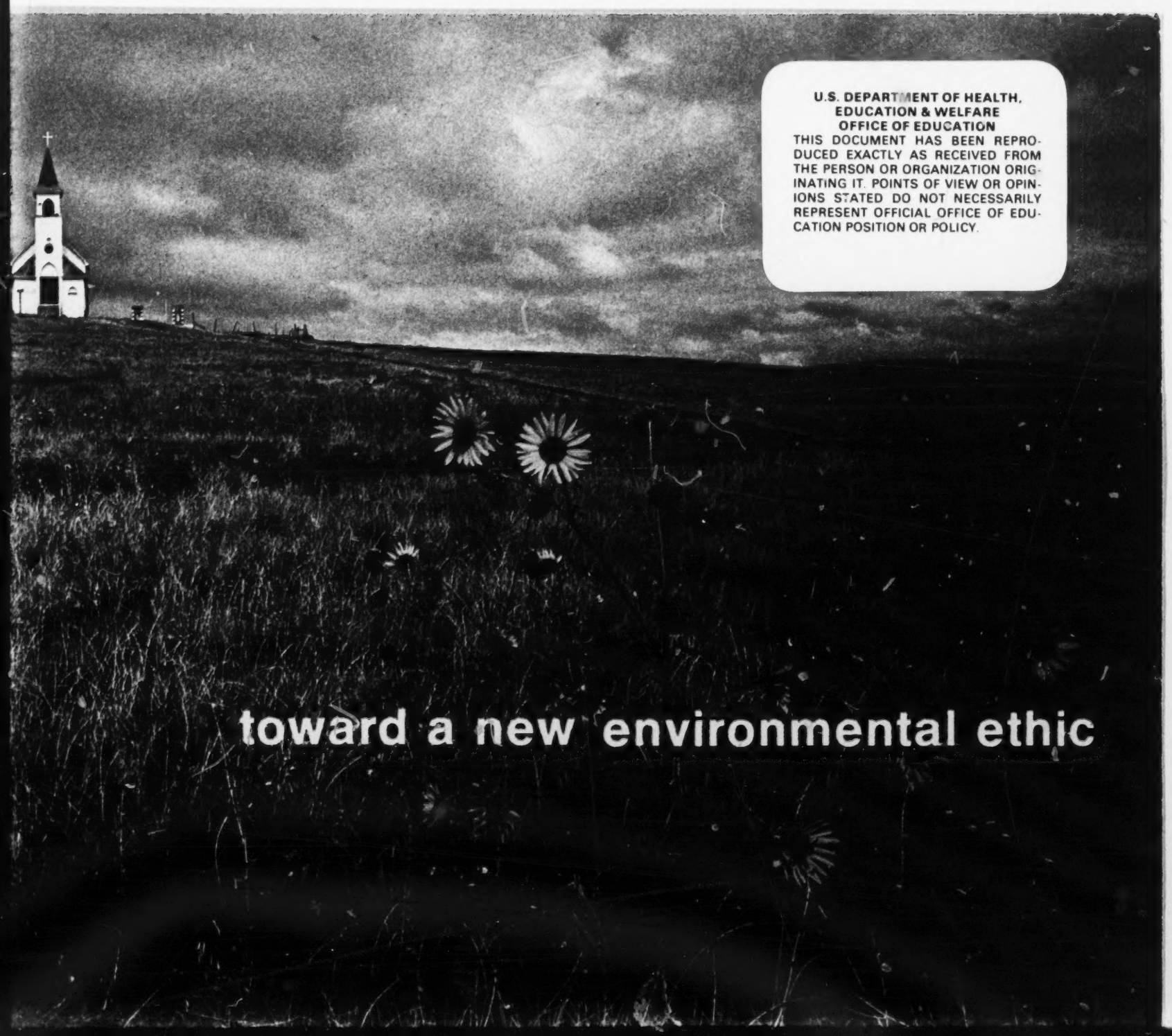
ABSTRACT

This pamphlet enumerates the goals and accomplishments of the Environmental Protection Agency (EPA) relating to standards-setting and enforcement, research and monitoring, technical and financial assistance, manpower development, citizens technology assessment, and review of environmental impact statements. Also discussed are EPA responsibilities and regulatory information in the areas of air pollution control, clean water, solid waste management, radiation, pesticides, and noise abatement. Numerous color photos enhance the narration. (BL)

SE 013 285

ED 061047

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.



toward a new environmental ethic

In proportio
which surr
the skin o
earth's surface
and other res
and this shallo
biosphere—tha
life. It is a clo
recycled and r

Man is, of
system and de
all living thin
of consciously
his survival an

Since the I
ing growth of
given us incre
this planet as

Our skill a
environment h
to human life
of the comm
trolled us, to
ing grew befo
and consume
beyond the re
discoveries an
purpose of en
gave too littl
order consequ
anticipate the
tions which

In proportion to the earth's size, the layer of air which surrounds our globe is no thicker than the skin on an apple. A shallow crust on the earth's surface provides a limited supply of water and other resources. This tiny envelope of air and this shallow crust of earth and water are the biosphere—that part of our world that supports life. It is a closed system in which all things are recycled and reused in support of the life process.

Man is, of course, a part of this closed life-system and dependent on it for his survival. Of all living things, however, he, alone, is capable of consciously cooperating with nature to insure his survival and progress.

Since the Industrial Revolution, the accelerating growth of science and applied technology has given us increased power and new tools to use this planet as we choose.

Our skill and ingenuity in manipulating the environment have produced tremendous benefits to human life. We have learned to control most of the communicable diseases which once controlled us, to produce bumper crops where nothing grew before, to produce energy, light, heat, and consumer conveniences which were once beyond the reach of kings. We used our scientific discoveries and our technological wonders for the purpose of enhancing life, but in the process we gave too little thought to the second- or third-order consequences of our actions. We failed to anticipate the fact that environmental modifications which have accompanied our good inten-

tions have a global impact on human health and welfare in direct and indirect ways, and on the generations to follow.

The wave of indignation about problems of air and water pollution which crested in the late 1960's has led our society to the discovery that we are dependent on and part of an eco-system that we did not invent and must not destroy.

This realization has forced us to ask ourselves some very fundamental questions. Where and how do we want economic and urban growth? How can we best use and reuse our natural resources? How can we adjust our priorities to insure that we fulfill our energy, transportation, housing, recreation, and personal consumer need, without intensifying environmental problems we did not anticipate and do not want?

More and more people within our society want to participate in the development of a new environmental ethic—a way of life which will allow us to retain and improve the life-enhancing features of technology without repeating and intensifying the mistakes of the past. A central role of the United States Environmental Protection Agency is to support this national effort and to help change those habits and those obsolete viewpoints which have led to our current confrontation with gross pollution and threats of irreversible environmental damage.

It will not be easy to change our habits, some of which have gone unquestioned for generations: throwing things away instead of repairing or recycling them, dumping our wastes into the water and air, and wasting irreplaceable resources. It is up to Americans of this decade to develop a new pattern of environmental management. We must become the first generation to work with nature instead of against her.

There is a generation of hard work ahead. Each of us must make his own contribution. But the task will seem less arduous if we focus on those opportunities for betterment which present themselves from day to day. The combined efforts of individuals, industries and governments at all levels—though they may seem small when viewed in isolation—can make an enormous collective impact. A national commitment, involving each American, will not only lift the veil of pollution from our skies and cleanse our turbid waters, it could help propel this nation toward a new era of social amenity far transcending the proud achievements of the past.

If we act wisely and with speed, we can extract long-range social dividends from our resources as well as short term private conveniences. We can elevate the quality of life as well as expand the quantity of goods. We can set an example for the world by turning from exploitation to preservation, from growth at any cost to growth for a purpose.

William D. Ruckelshaus, Administrator
United States Environmental Protection Agency
September 1971

n health and
and on the

problems of
d in the late
iscovery that
n eco-system
t destroy.

ask ourselves
Where and
ban growth?
our natural
iorities to in-
ansportation,
nsumer needs
problems we

society want
of a new en-
ich will allow
nhancing fea-
g and inten-
central role
al Protection
effort and to
ose obsolete
current con-
threats of ir-

habits, some
generations:

throwing things away instead of repairing or recycling them, dumping our wastes into the water and air, and wasting irreplaceable resources. It is up to Americans of this decade to develop a new pattern of environmental management. We must become the first generation to work with nature instead of against her.

There is a generation of hard work ahead. Each of us must make his own contribution. But the task will seem less arduous if we focus on those opportunities for betterment which present themselves from day to day. The combined efforts of individuals, industries and governments at all levels—though they may seem small when viewed in isolation—can make an enormous collective impact. A national commitment, involving each American, will not only lift the veil of pollution from our skies and cleanse our turbid waters, it could help propel this nation toward a new era of social amenity far transcending the proud achievements of the past.

If we act wisely and with speed, we can extract long-range social dividends from our resources as well as short term private conveniences. We can elevate the quality of life as well as expand the quantity of goods. We can set an example for the world by turning from exploitation to preservation, from growth at any cost to growth for a purpose.

William D. Ruckelshaus, Administrator
United States Environmental Protection Agency
September 1971

foreword

toward a new environmental ethic

History may well record that the beginning of the decade of the seventies marked the turning point in man's use and abuse of the precious planet of which he is both ward and guardian. Governments at all levels geared up for an attack on environmental problems. Citizens from every walk of life mobilized themselves to defend the environment for themselves and their children. Industries, great and small, began to embrace a new view of corporate responsibility for protecting the environment. International bodies began planning in earnest for global control of global pollution.

In our own country, the National Environmental Policy Act, signed into law on January 1, 1970, established a national policy to "maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."

Under the new law, the President appointed a Council on Environmetal Quality to coordinate environmental matters at the federal level and serve as his principal advisors in such matters.

All federal actions and proposals which could have significant impact on the environment were made subject to review by federal, state, and local environmental authorities.

In 1970, by order of the President with the consent of the Congress, federal programs dealing

a new
l ethic

History may well record that the beginning of the decade of the seventies marked the turning point in man's use and abuse of the precious planet of which he is both ward and guardian. Governments at all levels geared up for an attack on environmental problems. Citizens from every walk of life mobilized themselves to defend the environment for themselves and their children. Industries, great and small, began to embrace a new view of corporate responsibility for protecting the environment. International bodies began planning in earnest for global control of global pollution.

In our own country, the National Environmental Policy Act, signed into law on January 1, 1970, established a national policy to "maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."

Under the new law, the President appointed a Council on Environmetal Quality to coordinate environmental matters at the federal level and serve as his principal advisors in such matters.

All federal actions and proposals which could have significant impact on the environment were made subject to review by federal, state, and local environmental authorities.

In 1970, by order of the President with the consent of the Congress, federal programs dealing with the environment were reorganized and strengthened.

The National Oceanic and Atmospheric Administration was established in the Department of Commerce and made responsible for research on long-range effects of pollution on the physical environment, especially global trends affecting the oceans and the atmosphere.

The United States Environmental Protection Agency, reporting directly to the President, was charged with mounting an integrated, coordinated attack on pollution, filling the need, in the President's words, for "a strong independent agency" to serve as an objective, impartial arbiter of environmental matters, particularly in establishing and enforcing pollution control standards.

Federal anti-pollution laws were strengthened and appropriations increased in 1970. Old pollution control laws were being discovered, and new laws were under development.

But, of course, public policy decisions affecting the environment are not all made in Washington. All over America change is taking place—change that challenges the pessimistic view that man is helpless to control the technological forces he has set in motion, change growing out of a new ecological perspective, translating a new environmental ethic into environmental action.

More and more states and municipalities are adopting environmental policies and programs

which reflect a realistic understanding of ecologic relationships and needs.

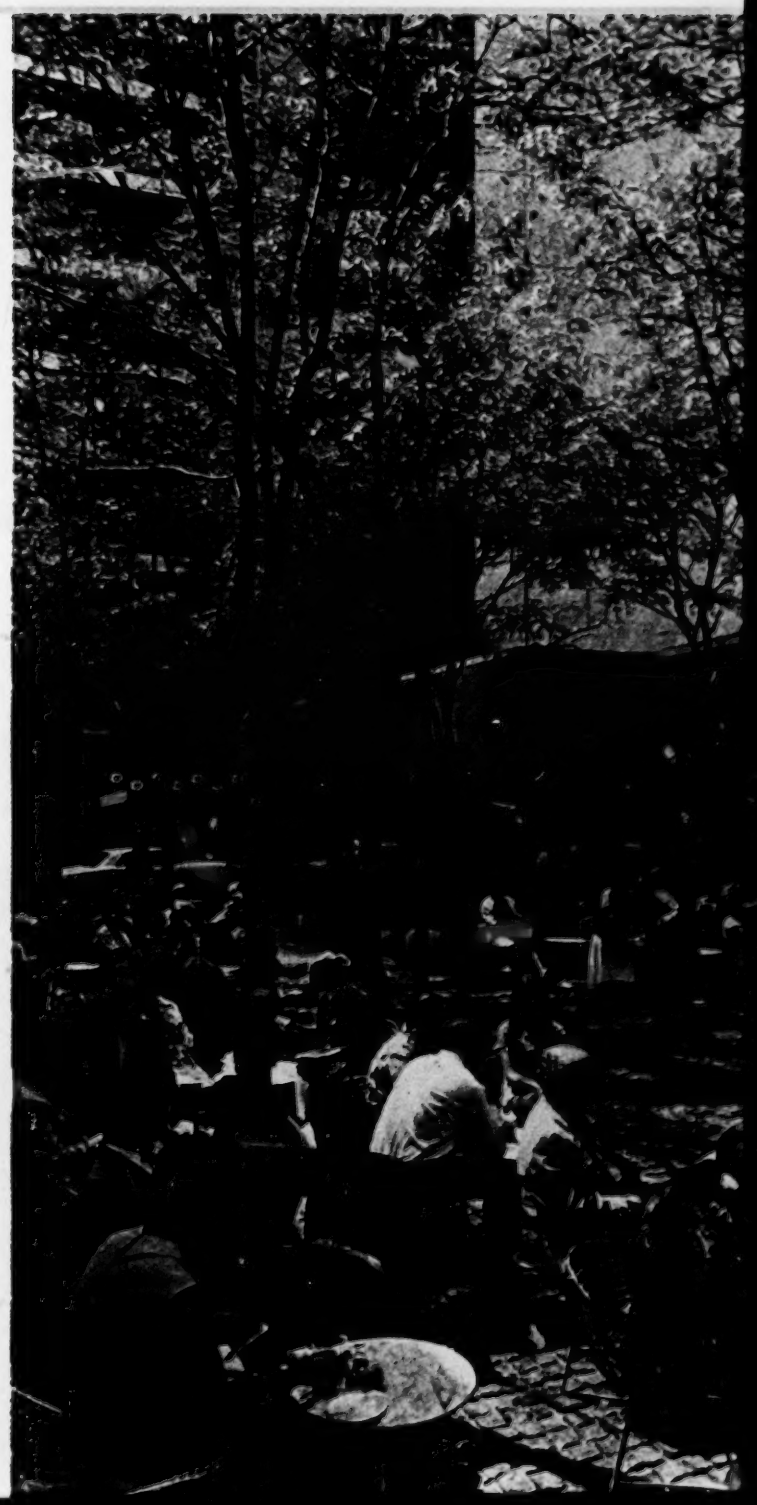
The concept of regional bodies to deal with environmental matters that overlap existing jurisdictional boundaries is gaining acceptance and effectiveness.

Industry, more and more, is demonstrating a desire to overcome obstacles to pollution control and to make a positive contribution to environmental quality.

People all over the country are insisting that we abandon the psychology of the blind bulldozer, that we refrain from paving over the whole world, that we stop polluting the air and the water and the earth. They are taking their cases to the courts. And their voices are being heard in corporate board rooms and by government officials and legislators at every level.

This last is the most important of all—the commitment of citizens of all ages and from all walks of life to environmental sanity. For the decisions that are being made today, and that will have to be made in the future, to preserve the environment, are truly decisions for our whole society.

The choice is ours. Americans are the privileged members of the free institutions of the richest country on earth. If we have the will, if we make sensible choices, we can build the kind of world we want—for ourselves and for those who will come after us.



ecologic

deal with
ing juris-
ance and

strating a
n control
environ-

sting that
bulldozer,
le world,
vater and
he courts.
corporate
cials and

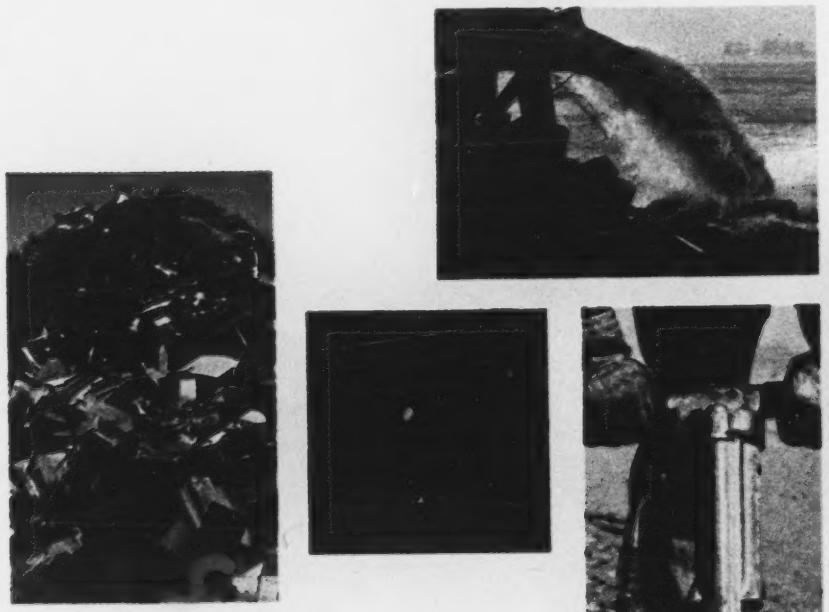
all—the
from all
r the de-
that will
serve the
ur whole

privileged
e richest
we make
of world
who will

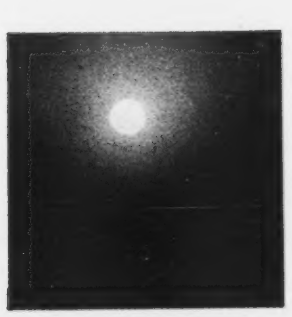
"The nineteen-seventies
absolutely must be
the years when America
pays its debt to the past
by reclaiming
the purity of its air,
its waters and
our living environment.
It is literally
now or never."

President Richard M. Nixon
January 1, 1970

the united states environmental pr



11



ited states environmental protection agency

11

12

The United States Environmental Protection Agency was established December 2, 1970, bringing together for the first time in a single agency the major environmental control programs of the Federal government. EPA is charged with mounting an integrated, coordinated attack on the environmental problems of air and water pollution, solid wastes management, pesticides, radiation, and noise.

To insure that the Agency is truly responsive to environmental needs in every part of the country, it has established a strong field organization, with Regional Offices located at ten major cities. The Regional Offices are staffed by specialists in each program area and headed by a Regional Administrator possessing broad authority to act for EPA in matters within his jurisdiction.

EPA's creation marked the end of the piecemeal approach to our nation's environmental problems which has, so often in the past, inhibited progress—or merely substituted one form of pollution for another.

EPA was created to lead a broad, comprehensive attack on pollution, and its administrative organization has been designed to make this approach a reality. The new organizational structure makes it easier to identify, and to take into account, all the factors bearing on pollution and its control. It makes it possible to resolve competing or conflicting program aims. It is facilitating the development of better information on the total impact of stresses reaching man from various parts of the environment, and makes possible more sensible choices about what constitutes a healthful, satisfying milieu for human life.

Most important of all, perhaps, EPA gives to the American people a single, independent, impartial agency to serve as their advocate for a livable environment.

standards-setting and enforcement

The United States Environmental Protection Agency is, first and foremost, a regulatory agency, with responsibilities for establishing and enforcing environmental standards, within the limits of its various statutory authorities.

Establishment of standards is central to the whole pollution control effort, for it is in this way that we define what each of us may and may not do to the environment on which we all depend.

Whatever we do, however careful we may be, we cannot avoid altering and being altered by the world about us. We are required, moreover, as was the first man, to use our human skills and ingenuity to convert the resources of the earth into the sustenance of human life.

The key, then, to sensible environmental control is to determine, within the limits of our knowledge, what changes are tolerable or useful and which must be banned or limited as harmful.

The standards set by EPA (in some cases, in cooperation with the States) have the force of law. They define the kinds of levels of pollutants which must be prevented from entering our air and water, and establish time-tables for achieving the prescribed quality. They set limits on radiation emissions and pesticide residues. Enforcement of environmental standards is, under certain

laws, sha
ment act
in other
primary

researc

EPA
analyzing
tific stud
tion, the
environm

Effecti
setting a
sound da
environm
on huma
to huma
ous rese
synthesis
ical and
in terms

Major
this time

- Expan
monit
lines
- Advan
expos
layed
of th
chemi

laws, shared with the States, the Federal government acting only when the State fails to do so; in other instances, the Federal government has primary enforcement authority.

research and monitoring

EPA is also a research body, monitoring and analyzing the environment and conducting scientific studies into the causes and effects of pollution, the techniques of pollution control, and the environmental consequences of man's actions.

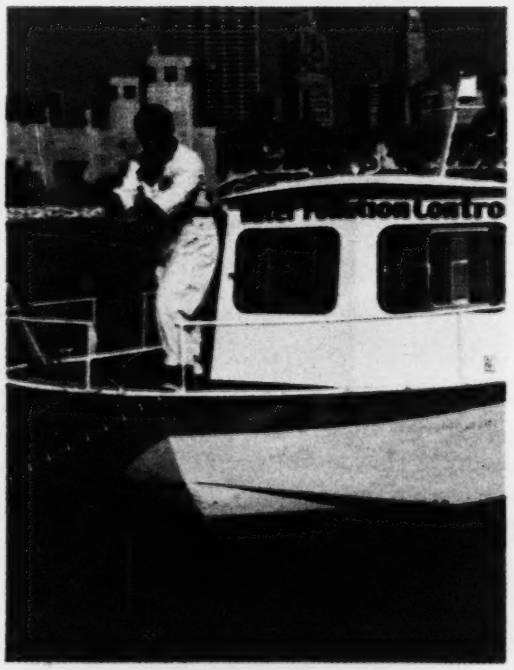
Effective action, particularly in standards-setting and enforcement, requires that EPA have sound data on what is being introduced into the environment, its impact on ecological stability, on human health, and on other factors important to human life. By close coordination of its various research programs, EPA strives to develop a synthesis of knowledge from the biological, physical and social sciences which can be interpreted in terms of total human and environmental needs.

Major aims of the Agency's research efforts at this time include:

- Expansion and improvement of environmental monitoring and surveillance to provide baselines of environmental quality.
- Advancement of understanding of long-term exposures to contaminants, of sub-acute or delayed effects on human and other organisms, of the combined and synergistic actions of chemical, biological, and physical stresses.

- Acceleration of progress in applied research into the control of pollutants, the recycling of so-called "wastes," and the development of sophisticated, non-polluting production processes.
- Improved assessment of trends of technical and social change and potential effects—first, second, and even third-order effects—on environmental quality.
- Improved understanding of the transport of materials through the environment; their passage through the media of air, water, and land; their ability to cross the various interfaces; and their various changes of state that can make them innocuous at one point and hazardous at another.

In addition to performing research in its own laboratories in various locations throughout the country, EPA, through grants and contracts, supports the studies of scientists in universities and other research institutions. The Agency also consolidates and evaluates information as it is developed throughout the scientific community to develop the best possible scientific *base* for environmental action.



technical and financial assistance

EPA serves also as a catalyst for environmental protection efforts at all levels of government by providing technical and financial assistance to state, regional, and local jurisdictions.

ed research
recycling of
elopment of
action proc-

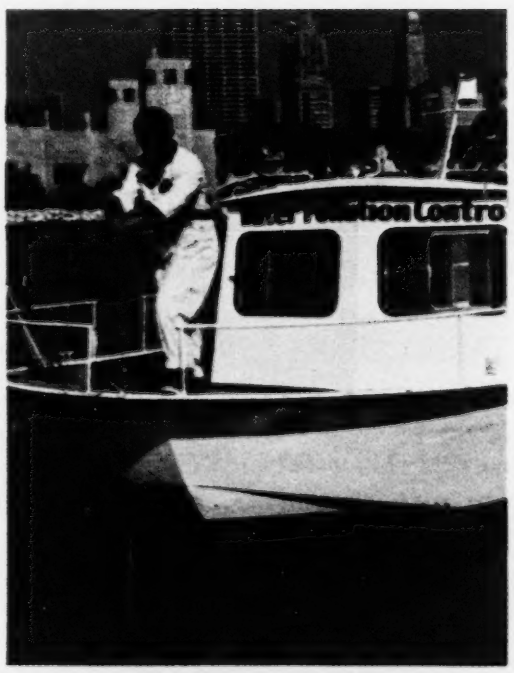
of technical
effects—first,
s—on envir-

transport of
their passage
; and land;
erfaces; and
t can make
l hazardous

n in its own
oughout the
ntracts, sup-
versities and
cy also con-
s it is devel-
unity to de-
for environ-

e

for environ-
s of govern-
ancial assist-
sdictions.



research facilities

EPA's research is carried out through three National Environmental Research Centers located at Cincinnati, Ohio; Research Triangle Park, North Carolina; and Corvallis, Oregon. In addition, EPA maintains the Western Environmental Research Laboratory in Las Vegas, Nevada, for extensive research in radiological health and related safety programs.

The Centers direct and coordinate the work of satellite laboratories in various parts of the country.

The programs conducted at each Center cover a wide range of problems in all aspects of pollution and pollution control. However, the Cincinnati Center gives particular emphasis to pollution control methods; the North Carolina Center to the health effects of environmental factors; and the Corvallis Center to ecological effects.

Laboratory locations include:

Dauphin Island, Alabama
Montgomery, Alabama
College, Alaska
Gulf Breeze, Florida
Perrine, Florida
Athens, Georgia
Chamblee, Georgia
Rockville, Maryland
Ann Arbor, Michigan
Grosse Ile, Michigan
Duluth, Minnesota
Las Vegas, Nevada
Ada, Oklahoma
Narragansett, Rhode Island
Bears Bluff, South Carolina
Gig Harbor, Washington

EPA publishes and gives wide distribution to its technical and scientific findings in all program areas, to advance the total body of scientific knowledge and hasten the application of new, proven pollution-control techniques.

Its "Technology Transfer" program is specifically designed to bridge the gap between the development and application of new techniques to control pollution. Workshops and seminars are held for state and local officials, design engineers, industrial representatives, and the public to introduce them to new, practicable control technology; technical bulletins and design manuals are widely disseminated.

Through EPA's ten Regional Offices, prompt assistance is given to State and local authorities, industries, and citizens in the solution of technical problems.

In several program areas, Federal funds are made available for the construction and operation of facilities to reduce pollution and to demonstrate new technology. Financial assistance is also provided for state and local governments to aid their environmental control programs.

manpower development

EPA provides training both in its own extensive training facilities and in universities and other educational institutions, to help develop the highly skilled manpower the Nation needs to combat environmental problems. Technical training in control techniques and program mana ment is given to employees of state and l governments, industry, and other organizati Support is given to universities for environme courses. Fellowships are available to quali students for advanced training.

citizens technology assessment

EPA also serves as a source of information the public. By widely disseminating scientific d bearing on environmental problems, it tries bring to concerned Americans the facts on wh they, individually and in community, can m sound, rational choices in environmental issues

The decisions that shape the world we live are being made daily, by thousands of people, homes and factories, in town councils and zon boards, at the ballot box and in the shopp center.

Each of us, every day, is making his o "technology assessment." We may not alw make the correct choice between competing be fits and costs, but we can, if we have the fa make a sensible choice.

the environment—a new ingredient

EPA is not, by any means, an environmen czar. For one thing, it shares many of its enfor ment authorities with the States, in accordan

e distribution to
ngs in all pro-
l body of scien-
plication of new,
ies.

rogram is spe-
gap between the
new techniques
and seminars are
design engineers,
public to intro-
ntrol technology;
nuals are widely

Offices, prompt
local authorities,
ution of technical

ederal funds are
on and operation
and to demon-
assistance is also
vernments to aid
grams.

in its own exten-
universities and
help develop the
Nation needs to
. Technical train-

ing in control techniques and program management is given to employees of state and local governments, industry, and other organizations. Support is given to universities for environmental courses. Fellowships are available to qualified students for advanced training.

citizens technology assessment

EPA also serves as a source of information to the public. By widely disseminating scientific data bearing on environmental problems, it tries to bring to concerned Americans the facts on which they, individually and in community, can make sound, rational choices in environmental issues.

The decisions that shape the world we live in are being made daily, by thousands of people, in homes and factories, in town councils and zoning boards, at the ballot box and in the shopping center.

Each of us, every day, is making his own "technology assessment." We may not always make the correct choice between competing benefits and costs, but we can, if we have the facts, make a sensible choice.

the environment—a new ingredient

EPA is not, by any means, an environmental czar. For one thing, it shares many of its enforcement authorities with the States, in accordance

review of federal activities

To ensure full consideration of environmental factors in Federal decision-making, each Federal agency is required to submit to the President's Council on Environmental Quality an *environmental impact statement* on any proposal for legislation or other major action significantly affecting the quality of the human environment. This must include:

- the environmental impact of the proposed action,
- any adverse environmental effects which cannot be avoided should the proposal be implemented,
- alternatives to the proposed action,
- the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Before filing with the Council, the statement must be circulated in draft to EPA and other appropriate federal, state, and local environmental agencies for their comments. These must accompany the final statement.

The final environmental impact statement, together with all comments, must be made available to the Congress and the public by the originating agency. Federal agencies must insure the fullest practicable provision of timely public information and understanding of the environmental impact of federal plans and programs including, whenever appropriate, public hearings.

EPA is specifically charged with making public its written comments on environmental impact statements and with publishing its determinations when these hold that a proposal is unsatisfactory from the standpoint of public health or welfare or environmental quality.

The Council on Environmental Quality considers all the evidence and advises the President as to the best course of action.

with principles and procedures established by the Congress in the legislation governing its activities.

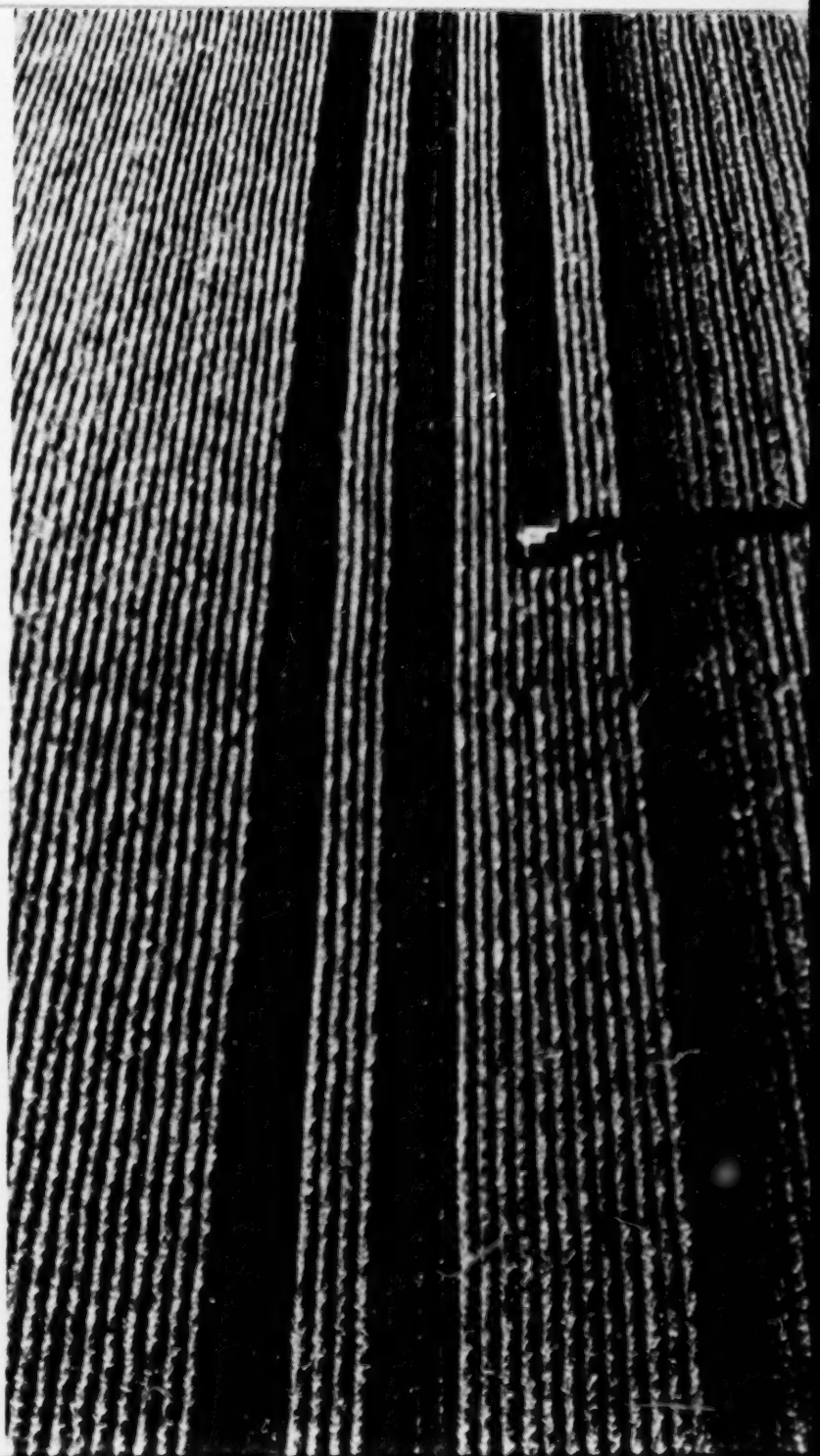
Moreover, since "the environment," after all, is practically everything, it follows that many agencies of government conduct activities that directly affect it. The Department of Transportation, for example, is concerned with highways, railroads, and air transport. The Department of Interior administers public lands and natural resources. The Departments of Housing and Urban Development; Agriculture; Health, Education, and Welfare; Defense—all carry out activities that are of the greatest importance in determining not only the kind of life we live but also the kind of world we live it in.

Under the National Environmental Policy Act, all departments of government are required to take into account the environmental impact of proposed actions and these are subjected to careful scrutiny before action can be undertaken.

to add it all up

Our Nation has resolved to "maintain conditions under which man and nature can exist in productive harmony." The United States Environmental Protection Agency has a key role to play in carrying out that National policy.

EPA is determined to be an advocate for the environment wherever it can, whenever it can, as decisions about our Nation's future are being made—whether it be in the councils of government, in the boardrooms of industry, or in the living rooms of our citizens.



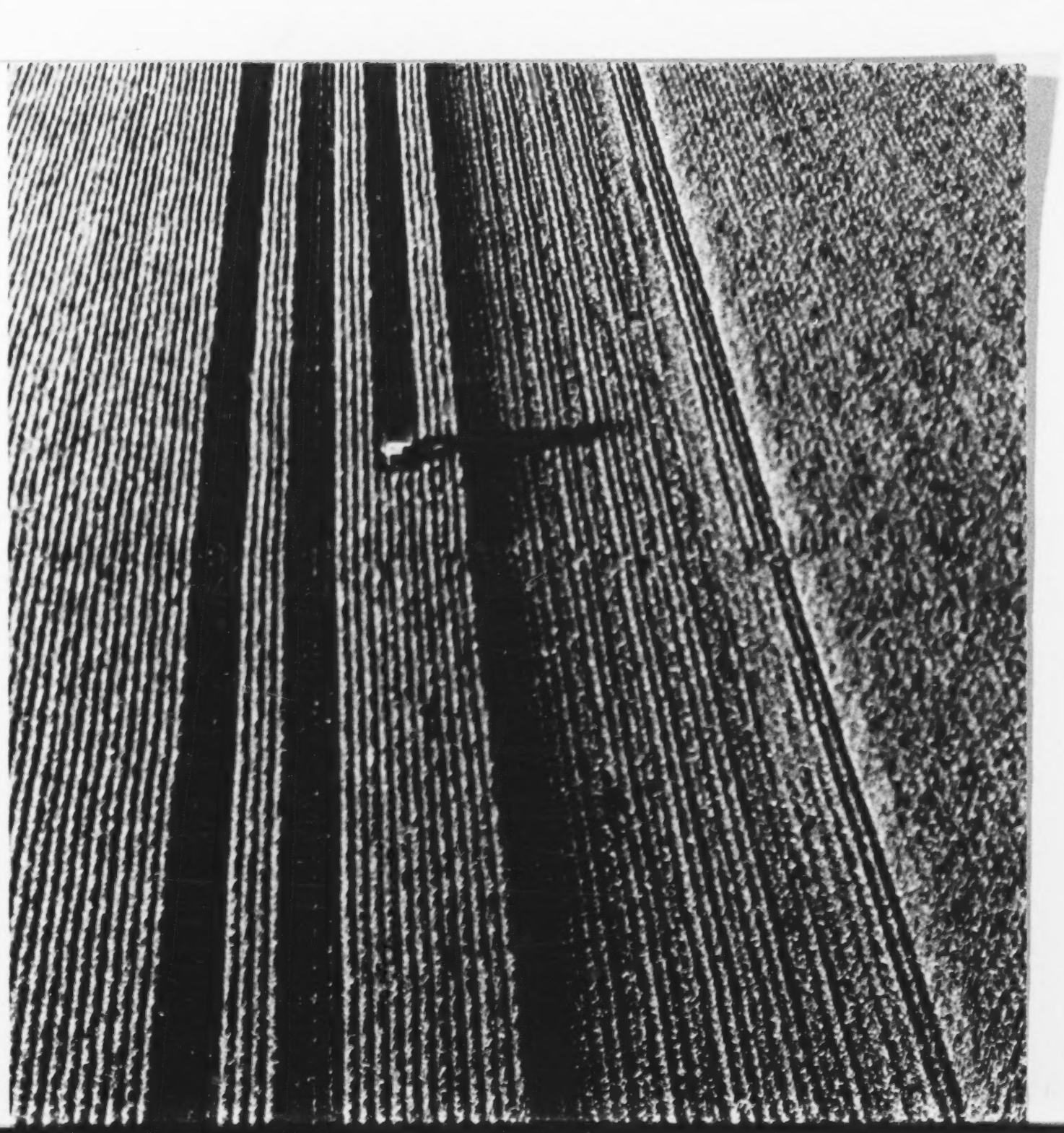
s established by the
verning its activities.

ronment," after all,
follows that many
duct activities that
ment of Transporta-
ned with highways,
The Department of
nds and natural re-
Housing and Urban
alth, Education, and
ut activities that are
in determining not
but also the kind of

nmental Policy Act,
ent are required to
onmental impact of
e subjected to care-
be undertaken.

o "maintain condi-
nature can exist in
ited States Environ-
s a key role to play
policy.

an advocate for the
, whenever it can,
n's future are being
councils of govern-
industry, or in the



In the United States air pollution is a problem in all large cities and in many small towns. Each year over 200 million tons of manmade waste products are released into the air of the United States. About half of this pollution is produced as a result of the transportation system, coming chiefly from the internal-combustion engine.

In terms of weight—which is not necessarily in all cases the best indication of their importance—according to 1969 estimates 51 percent of these pollutants come from transportation sources, 16 percent from fuel combustion in stationary sources, 15 percent from industrial processes, 4 percent from solid waste disposal practices and 14 percent from forest fires and other miscellaneous sources. The main classes of primary pollutants include sulfur oxides, particulate matter, carbon monoxide, hydrocarbons and nitrogen oxides. Numerous other noxious gases and harmful particulates also are introduced into the atmosphere from a variety of specific activities. Photochemical oxidants, a category of secondary pollutants of extreme importance, are formed in the atmosphere when, under the influence of sunlight, nitrogen oxides combine with gaseous hydrocarbons.

At levels commonly found in urban areas, air pollution contributes to the incidence of such chronic ailments as emphysema, bronchitis, and asthma; diseases which have increased dramatically in recent decades.

Moreover, chemical and radiological substances produced by modern technology may threaten our health and the health of future generations in ways that we are far from fully understanding. Scientists are now beginning to give attention to such matters as the capacity of chemical agents in the atmosphere to produce mutagenic effects in biological systems, the metabolism of absorbed pollutants, the ways in which pollutants may alter the normal biochemistry of cells, affect the hormonal system, and alter the general functions of body activity.

The adverse economic effects of air pollution are much more varied and substantial than is generally realized. They range from the waste of fuel and other valuable resources, through the soiling and corrosion of physical structures of all kinds, to damage to agriculture and forests. Moreover, by reducing visibility, air pollution contributes to the toll of accidents in both air and ground travel.

Within the last decade we have begun to understand that air pollution is a complex phenomenon of global significance. It involves gaseous as well as particulate contaminants; both can sometimes be altered and rendered more hazardous through interreactions which occur in the atmosphere under the influence of sunlight, moisture and other environmental factors.

The first Federal program on air pollution was developed in 1955 when the Public Health Service conducted a modest air pollution research program and offered technical assistance to state and local governments, which traditionally have had primary responsibility for dealing with community air pollution problems.

In 1963 Congress passed the landmark Clean Air Act. This law authorized financial assistance to state and local governments for the initiation and improvement of control programs, federal-

problem
towns.
manmade
ir of the
n is pro-
system,
mbustion

ssarily in
rtance—
of these
irces, 16
tationary
cesses, 4
ices and
r miscel-
nary pol-
e matter,
nitrogen
nd harm-
o the at-
ctivities.
econdary
ormed in
e of sun-
gaseous

areas, air
of such
nitis, and
amatical-

cal sub-
ogy may
ture gen-
ly under-

standing. Scientists are now beginning to give attention to such matters as the capacity of chemical agents in the atmosphere to produce mutagenic effects in biological systems, the metabolism of absorbed pollutants, the ways in which pollutants may alter the normal biochemistry of cells, affect the hormonal system, and alter the general functions of body activity.

The adverse economic effects of air pollution are much more varied and substantial than is generally realized. They range from the waste of fuel and other valuable resources, through the soiling and corrosion of physical structures of all kinds, to damage to agriculture and forests. Moreover, by reducing visibility, air pollution contributes to the toll of accidents in both air and ground travel.

Within the last decade we have begun to understand that air pollution is a complex phenomenon of global significance. It involves gaseous as well as particulate contaminants; both can sometimes be altered and rendered more hazardous through interreactions which occur in the atmosphere under the influence of sunlight, moisture and other environmental factors.

The first Federal program on air pollution was developed in 1955 when the Public Health Service conducted a modest air pollution research program and offered technical assistance to state and local governments, which traditionally have had primary responsibility for dealing with community air pollution problems.

In 1963 Congress passed the landmark Clean Air Act. This law authorized financial assistance to state and local governments for the initiation and improvement of control programs, federal-

air pollution control

interstate abatement actions, and the publication of criteria describing the effects of pollution. The law placed special emphasis on gaseous pollutants, particularly exhaust emissions from motor vehicles, and sulfur oxides from stationary sources.

In 1965, amendments to the Clean Air Act gave the federal program authority to curb motor vehicle emissions. Federal standards were first applied to 1968 model motor vehicles.

The Air Quality Act of 1967 called for a new and more comprehensive approach to the problem. It required the designation of air quality regions on the basis of meterologic and urban factors, and the publication of criteria documents (describing the effects of pollutants) accompanied by related documents on the types and costs of techniques available to carry out source control. Armed with these data, Governors were required to establish air quality standards and implementation plans for regions designated. The work accomplished under the 1967 legislation paved the way for enactment of the Clean Air Act Amendments of 1970 which were signed into law on December 31, 1970.

Under the provisions of the Clean Air Act Amendments of 1970:

• EPA established in 1971 *national ambient air quality standards* specifying the maximum levels to be permitted in the ambient air of the six principal and most widespread classes of air pollutants: particulate matter, sulfur oxides, hydrocarbons, carbon monoxide, photochemical oxidants, and nitrogen oxides. These comprise *primary* standards, required to protect the public health, and *secondary* standards (requiring further reductions in particulates and sulfur oxides),

to prevent the many other undesirable effects of pollution.

• States must carry out approved *implementation plans* for limiting the emission of pollutants so as to achieve the *primary* standards by mid-1975 and to achieve the *secondary* standards within a reasonable period of time. If any State should fail to develop or carry out such plans, EPA is authorized to do so.

• EPA establishes and enforces *performance standards* (emission standards) limiting emissions from new or modified stationary sources of pollutants. The first such performance standards issued cover large steam-electric generating plants, municipal incinerators, cement factories, and sulfuric and nitric acid plants.

• EPA establishes and enforces Federal *emission standards* for pollutants that, while not necessarily widespread, are exceptionally hazardous to human health. Standards limiting emissions of beryllium, mercury, and asbestos are being promulgated in 1971.

the publication
f pollution. The
gaseous pollu-
ons from motor
ationary sources.
Clean Air Act
y to curb motor
lards were first
icles.
called for a new
ch to the prob-
n of air quality
logic and urban
iteria documents
ts) accompanied
es and costs of
source control.
rs were required
and implemen-
d. The work ac-
lation paved the
Air Act Amend-
ed into law on

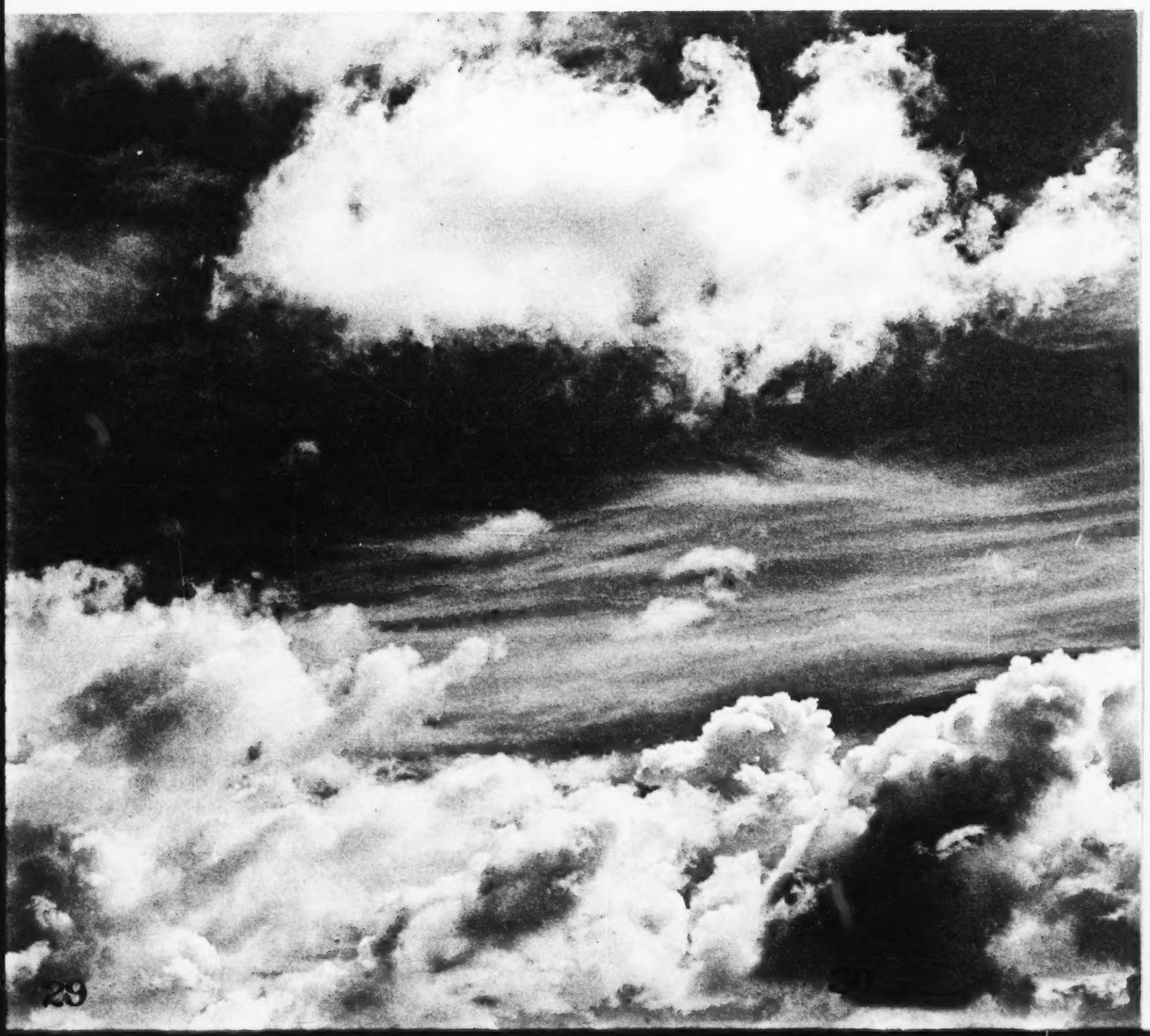
Clean Air Act

national ambient
the maximum
ent air of the six
lasses of air pol-
r oxides, hydro-
otochemical oxi-
se comprise *pri-*
otect the public
s (requiring fur-
d sulfur oxides),

to prevent the many other undesirable effects of pollution.

- States must carry out approved *implementation plans* for limiting the emission of pollutants so as to achieve the *primary* standards by mid-1975 and to achieve the *secondary* standards within a reasonable period of time. If any State should fail to develop or carry out such plans, EPA is authorized to do so.
- EPA establishes and enforces *performance standards* (emission standards) limiting emissions from new or modified stationary sources of pollutants. The first such performance standards issued cover large steam-electric generating plants, municipal incinerators, cement factories, and sulfuric and nitric acid plants.
- EPA establishes and enforces Federal *emission standards* for pollutants that, while not necessarily widespread, are exceptionally hazardous to human health. Standards limiting emissions of beryllium, mercury, and asbestos are being promulgated in 1971.

- EPA establishes and enforces *emission standards* for new motor vehicles. Standards have been promulgated requiring a reduction of 90 percent in hydrocarbons and carbon monoxide emitted by 1975 models as compared with the 1970 requirements, and a 90 percent reduction in oxides of nitrogen by 1976.
- EPA may regulate or prohibit the manufacture or sale of fuels or fuel additives that result in harmful emissions or interfere with motor vehicle pollution control devices. The first such regulations will cover alkyl lead.
- Research is being stepped up and incentives are provided to encourage the early development of low-polluting motor vehicle propulsion systems, including government purchase and use of vehicles employing such systems.
- EPA is investigating the effects and control of aircraft emissions, and will publish, in September 1971, *emission standards* for aircraft, to be enforced by the Secretary of Transportation.
- Citizens are specifically authorized to take civil court action against private or governmental officials failing to carry out the provisions of the law. Public hearings are required at various steps in the standards-setting, enforcement, and regulatory procedures to enable all interested persons to make their feelings known.
- EPA conducts extensive *research* into all aspects of air pollution, both in its own laboratories and through grants and contracts. It constructs and operates *demonstration plants* or processes, or financially assists such projects.
- *Financial grants* are made to state, interstate, and local agencies to aid their air pollution control programs.



clean water

Our streams and rivers, our fresh water lakes, our salty bays and estuaries—these life-giving waters are among America's most precious natural endowments.

Yet today, many of our waters are grossly polluted by a staggering load of waste materials from farm, factory, and home, and there is scarcely a stream that does not bear some mark of man's abuse. The list of "most polluted" rivers spans the continent.

Certain pollutants, such as the phosphates, provide an excess of nutrients which disturb the ecological balance of our lakes and, by stimulating plant growth, greatly accelerate the otherwise slow, natural aging process. Lake Erie—not dead but surely dying—is an outstanding example of this "eutrophication" process.

Contamination of our coastal waters prevents the harvesting of fish and shellfish in many areas. Dredging and filling operations threaten the estuarine waters that nurture aquatic life. Oil fouls our beaches and destroys fish and sea birds.

The ocean depths themselves are showing the effects; and far from the sources of pollution, polar bears and penguins carry DDT in their fatty tissues.

Even water far below the ground—the precious moisture that serves so many municipal drinking systems—faces pollution danger from poisonous wastes pumped into the earth.

The pollutants which clog America's waters are a mixed brew, and come from millions of sources:

- More than 1,300 communities still discharge their sewage into the waterways without any treatment whatever. An equal number employ only

Our streams and rivers, our fresh water lakes, our salty bays and estuaries—these life-giving waters are among America's most precious natural endowments.

Yet today, many of our waters are grossly polluted by a staggering load of waste materials from farm, factory, and home, and there is scarcely a stream that does not bear some mark of man's abuse. The list of "most polluted" rivers spans the continent.

Certain pollutants, such as the phosphates, provide an excess of nutrients which disturb the ecological balance of our lakes and, by stimulating plant growth, greatly accelerate the otherwise slow, natural aging process. Lake Erie—not dead but surely dying—is an outstanding example of this "eutrophication" process.

Contamination of our coastal waters prevents the harvesting of fish and shellfish in many areas. Dredging and filling operations threaten the estuarine waters that nurture aquatic life. Oil fouls our beaches and destroys fish and sea birds.

The ocean depths themselves are showing the effects; and far from the sources of pollution, polar bears and penguins carry DDT in their fatty tissues.

Even water far below the ground—the precious moisture that serves so many municipal drinking systems—faces pollution danger from poisonous wastes pumped into the earth.

The pollutants which clog America's waters are a mixed brew, and come from millions of sources:

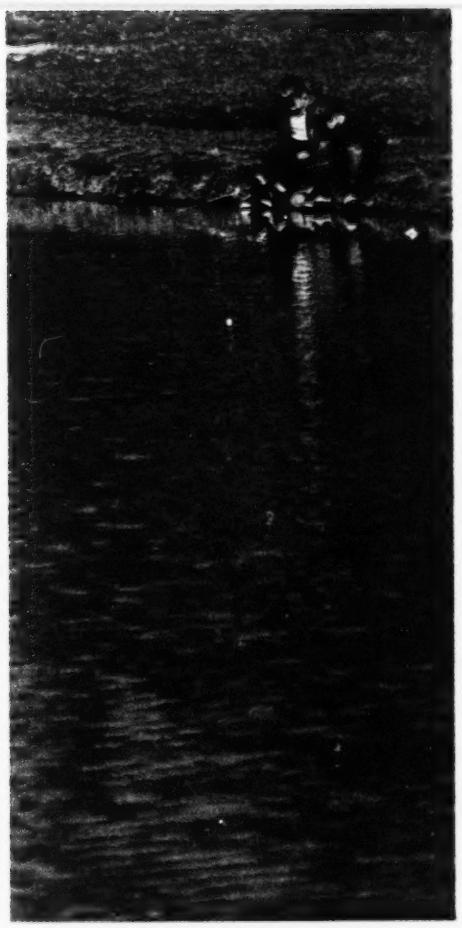
- More than 1,300 communities still discharge their sewage into the waterways without any treatment whatever. An equal number employ only primary treatment, removing 30 to 40 percent of some pollutants. The waste flows from municipal systems are expected to increase by nearly four times over the next 50 years.
- Approximately 240,000 water-using industrial plants generate the largest volume and the most toxic of pollutants. The volume is growing.
- Oil spills from vessels and offshore drilling have produced tragic destruction along ocean beaches, while less spectacular spills, totaling thousands of barrels of oil, occur almost daily in waters across the nation.

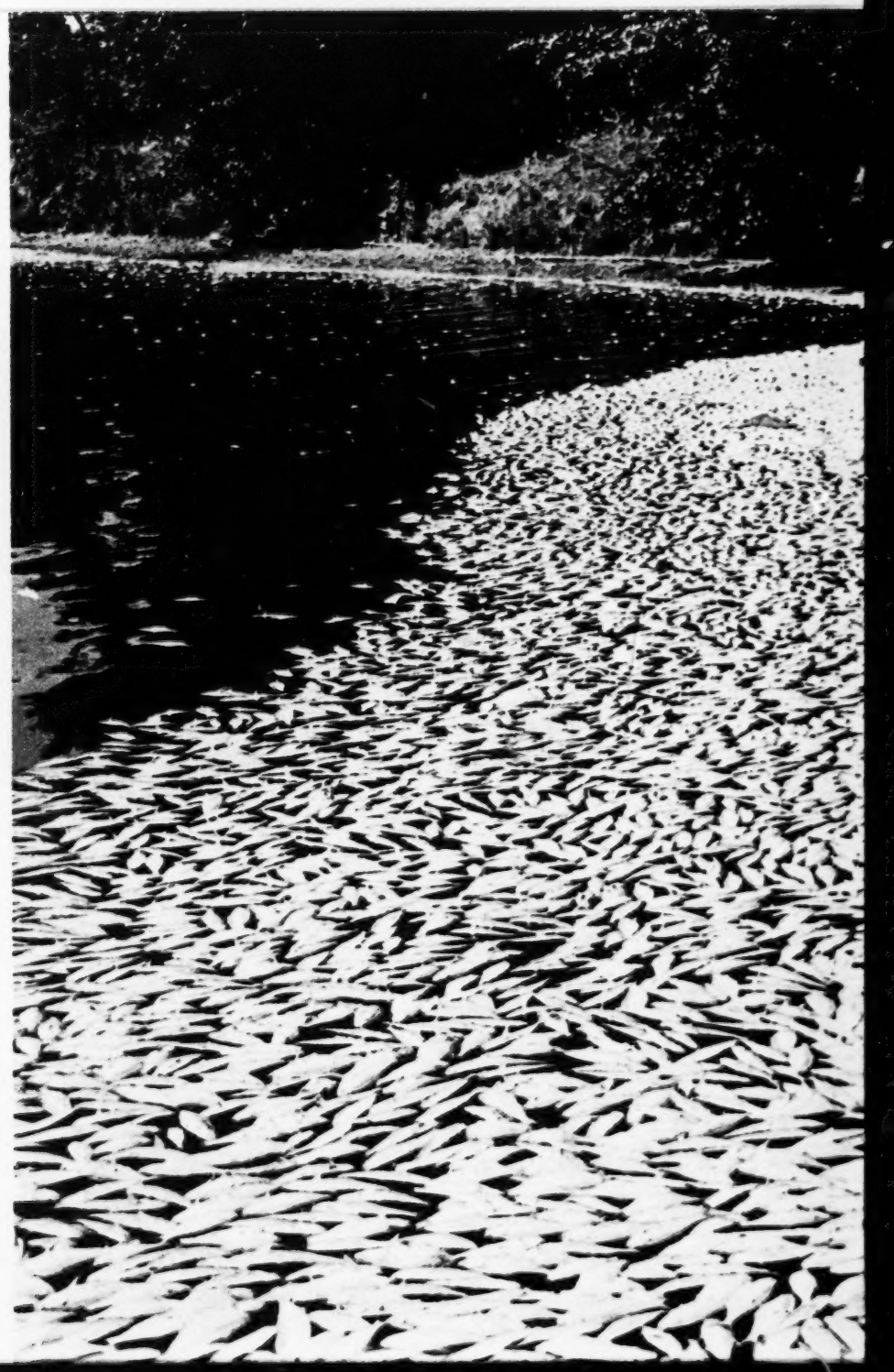
Other important sources:

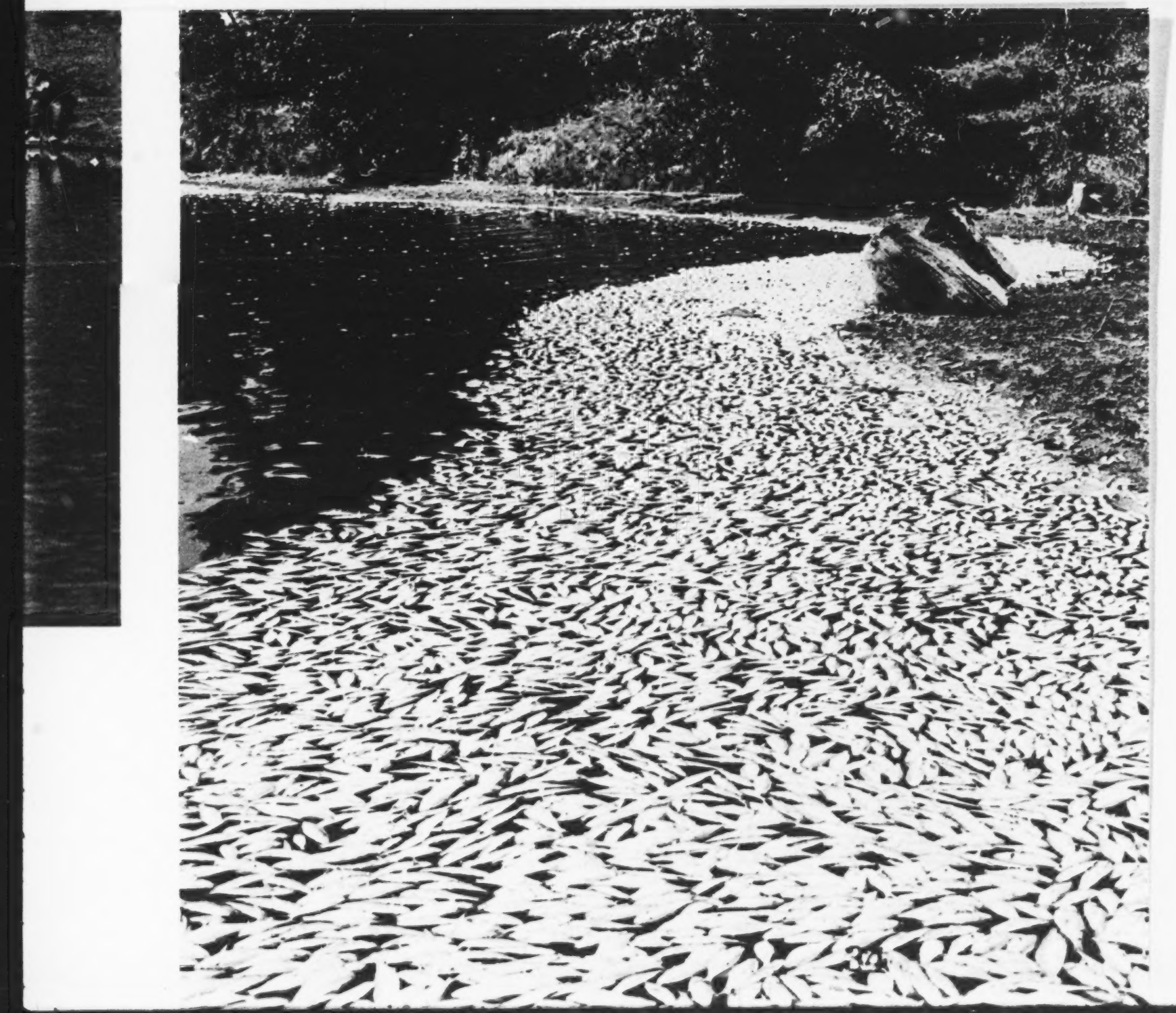
- Animal wastes from feedlots, fertilizer and pesticide runoff from fields and forests.
- Irrigation return-flows bearing fertilizer, pesticides and salts leached from the soil.
- Acid and sediment drainage from mining operations.
- Heated water, discharged principally by the electric power industry, which threatens aquatic life.

Federal clean water efforts were first launched in 1948 on a trial basis, and a permanent program established with passage of the Federal Water Pollution Control Act, in 1956. By the late 1960's a broad program based on federal/state cooperation in establishing and enforcing water quality standards, river basin planning, and federal grants for construction of waste treatment facilities was in operation.

An important new mechanism for achieving clean water was provided when a Federal court decision in 1966 held that the Refuse Act of 1899 (previously applied only to debris that might obstruct navigation) outlaws industrial discharges







of pollutants into navigable waters or their tributaries without a permit. Today, the provisions of this act are being increasingly invoked against polluters.

The Water Quality Improvement Act of 1970 included important new authorities to fight pollution, and today a massive effort has been launched to restore America's waters.

Major features of the current Federal Program are:

standards setting

• Under the Water Quality Act of 1965, each of the States, and the District of Columbia, Guam, Puerto Rico, and the Virgin Islands have been in the process of establishing water quality standards for all interstate and coastal waters. These must be fully approved by EPA by January 1, 1972. The standards specify stream use classification (recreation, fish and wildlife propagation, public water supplies, industrial and agricultural uses); the quality of water required to support these uses; and complete plans for achieving and enforcing the desired levels of quality.

Over 90 percent of all interstate waters have been classified for either recreation or fish and wildlife propagation uses, which require high quality water.

enforcement

• States have first responsibility for enforcing the water quality standards. However, if the standards are violated, EPA may enforce them through procedures provided by the Water Quality Act or by initiating civil or criminal action under the Refuse Act.

One of the EPA Administrator's first official acts was to issue violation notices to three major

cities placing them
tion must be take
prosecution; by the
agreement had bee
state-local construct
plants. In the Agenc
notices were issue
polluters. These inc
discharge sewage int

In several instanc
ment by convening
state officials, a pr
a public hearing
violator if required.
conferences called
the interstate wate
Connecticut and N
and its tributaries
Dakota, and of Pe
ences concluded o
Superior resulted in
pollution.

As of mid-1971,
actions had been
chargers by the U.S
the Refuse Act pr
had been concluded
settlements. In civi
ers of mercury, a
chargers from 139
brought about, with
depending on EPA
reduction; in one c
was shut down. Cr
erally resulted in
fines; in one case,

of pollutants into navigable waters or their tributaries without a permit. Today, the provisions of this act are being increasingly invoked against polluters.

The Water Quality Improvement Act of 1970 included important new authorities to fight pollution, and today a massive effort has been launched to restore America's waters.

Major features of the current Federal Program are:

standards setting

• Under the Water Quality Act of 1965, each of the States, and the District of Columbia, Guam, Puerto Rico, and the Virgin Islands, have been in the process of establishing water quality standards for all interstate and coastal waters. These must be fully approved by EPA by January 1, 1972. The standards specify stream use classification (recreation, fish and wildlife propagation, public water supplies, industrial and agricultural uses); the quality of water required to support these uses; and complete plans for achieving and enforcing the desired levels of quality.

Over 90 percent of all interstate waters have been classified for either recreation or fish and wildlife propagation uses, which require high quality water.

enforcement

• States have first responsibility for enforcing the water quality standards. However, if the standards are violated, EPA may enforce them through procedures provided by the Water Quality Act or by initiating civil or criminal action under the Refuse Act.

One of the EPA Administrator's first official acts was to issue violation notices to three major cities placing them on notice that corrective action must be taken within 180 days to avoid prosecution; by the end of the 180-day period, agreement had been reached for joint federal-state-local construction of the needed treatment plants. In the Agency's first eight months, 47 such notices were issued to municipal or industrial polluters. These included 32 municipalities which discharge sewage into Lake Erie.

In several instances, EPA has initiated enforcement by convening a conference of federal and state officials, a procedure which is followed by a public hearing and court action against the violator if required. Of major importance are new conferences called to enforce standards covering the interstate waters of Long Island Sound in Connecticut and New York, of Galveston Bay and its tributaries in Texas, of western South Dakota, and of Pearl Harbor, Hawaii. Conferences concluded on Lake Michigan and Lake Superior resulted in major EPA actions to abate pollution.

As of mid-1971, more than 50 civil or criminal actions had been brought against industrial dischargers by the U.S. Department of Justice under the Refuse Act provisions. Fourteen civil suits had been concluded favorably by court-approved settlements. In civil actions against ten dischargers of mercury, a prompt reduction of total dischargers from 139 pounds to 2 pounds daily was brought about, with final disposition of the cases depending on EPA approval of plans for further reduction; in one case only, the discharging plant was shut down. Criminal prosecutions have generally resulted in convictions and assessment of fines; in one case, a violator was fined $125,000.

the refuse act permit program

By Presidential Order, a new permit program has been established under the provisions of the Refuse Act of 1899. Effective July 1, 1971, a permit from the U.S. Army Corps of Engineers is required for the discharge of any industrial waste into navigable waters or their tributaries. If, in the judgment of EPA, a discharge violates water quality standards, no permit can be issued. Violators are liable to swift Federal enforcement procedures.

construction of treatment facilities

EPA makes available federal funds to aid the construction of new or improved municipal sewage treatment plants. From the inception of the federal grant program in 1957 through July 1971, nearly $3 billion had been provided for over 12,000 projects. During the last half of 1971, the level of funding rose to $2 billion annually. By the end of 1974, EPA expects to have projects funded and underway that will provide secondary treatment for almost all municipal waste water.

oil spills

The Water Quality Improvement Act of 1970 prohibits the discharge of harmful quantities of oil into or upon the navigable waters of the United States or their shores. It applies to onshore and offshore facilities, as well as to vessels. The owner or operator is liable for cleanup costs and heavy penalties for knowingly discharging oil in harmful quantities.

EPA cooperates with the Coast Guard and other federal agencies in administering this Act and plays a primary role in implementing the National Contingency Plan for the removal of oil spills.

sewage from vessels

The 1970 legislation gave EPA authority to set performance standards, which will be enforced by the Coast Guard, for marine sanitation devices. Proposed standards were published in May 1971, requiring the equivalent of secondary treatment for vessel discharges. After all comments are considered, final standards are to be promulgated.

water hygiene

EPA establishes recommended health standards for municipal drinking water supplies, and waters used for recreation and shellfish-growing. These are generally used by States for assessing and improving the quality of water supplies within their boundaries. EPA may ban the use of unsafe water supplies on interstate carriers.

research and development

EPA supports research and demonstration projects, looking toward better means of controlling all forms of water pollution, with particular emphasis on finding improved ways to help municipalities and industry do the job.

other activities

EPA encourages effective river basin planning that takes into account all factors affecting water quality, provides expert technical assistance on difficult pollution problems, supports the training of much needed manpower in all aspects of pollution control, and gives financial and other assistance to States to help them strengthen their own control programs.

n

y permit program
provisions of the
July 1, 1971, a
orps of Engineers
of any industrial
their tributaries.
discharge violates
mit can be issued.
deral enforcement

ilities

funds to aid the
d municipal sew-
inception of the
hrough July 1971,
rovided for over
st half of 1971,
billion annually.
ects to have pro-
will provide secon-
municipal waste

ment Act of 1970
mful quantities of
le waters of the
It applies to on-
well as to vessels.
for cleanup costs
ingly discharging

Coast Guard and
nistering this Act
implementing the

National Contingency Plan for the removal of oil spills.

sewage from vessels

The 1970 legislation gave EPA authority to set performance standards, which will be enforced by the Coast Guard, for marine sanitation devices. Proposed standards were published in May 1971, requiring the equivalent of secondary treatment for vessel discharges. After all comments are considered, final standards are to be promulgated.

water hygiene

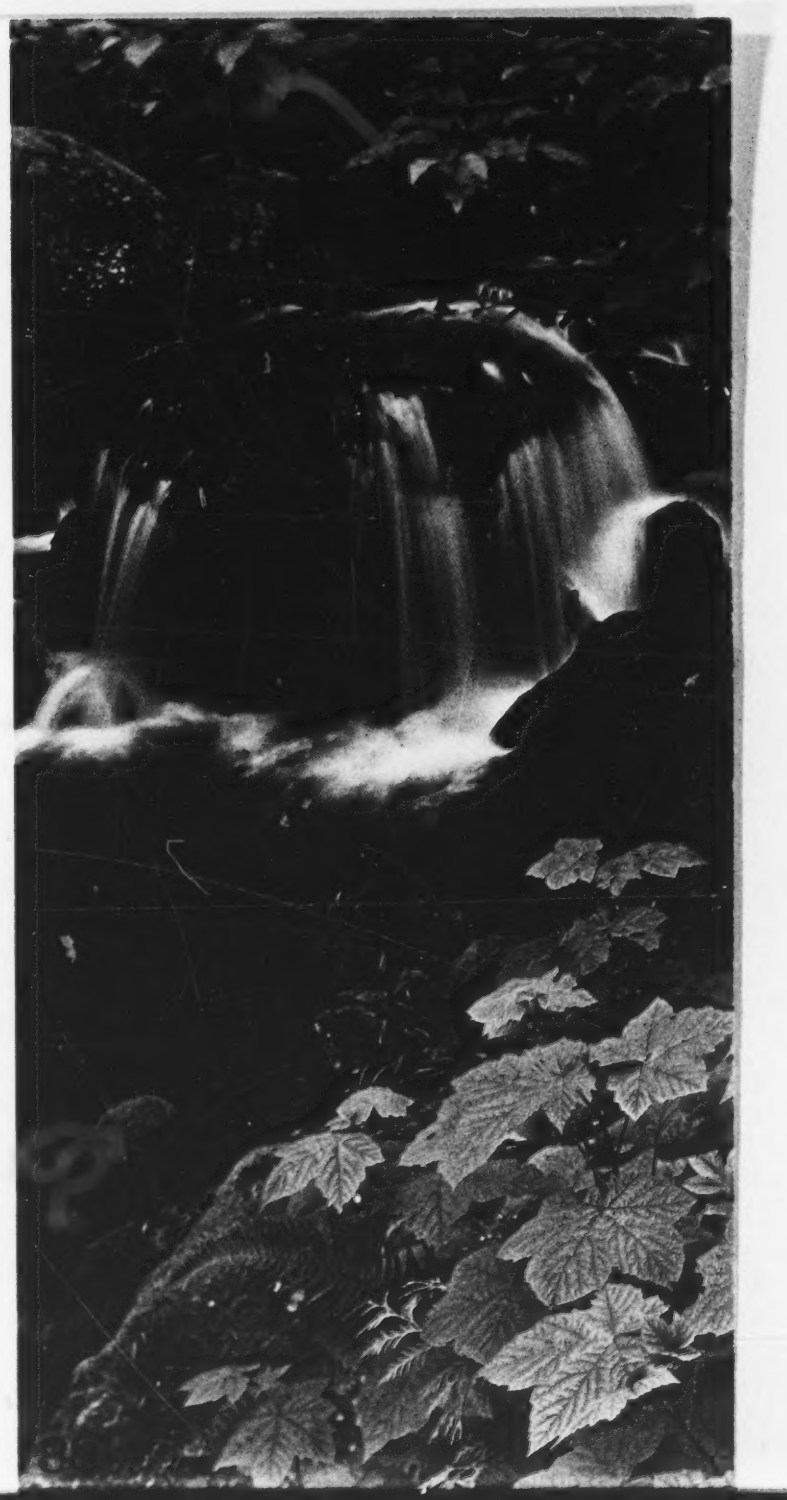
EPA establishes recommended health standards for municipal drinking water supplies, and waters used for recreation and shellfish-growing. These are generally used by States for assessing and improving the quality of water supplies within their boundaries. EPA may ban the use of unsafe water supplies on interstate carriers.

research and development

EPA supports research and demonstration projects, looking toward better means of controlling all forms of water pollution, with particular emphasis on finding improved ways to help municipalities and industry do the job.

other activities

EPA encourages effective river basin planning that takes into account all factors affecting water quality, provides expert technical assistance on difficult pollution problems, supports the training of much needed manpower in all aspects of pollution control, and gives financial and other assistance to States to help them strengthen their own control programs.



While accounting for only 7 percent of the world's population, Americans consume nearly half of the earth's industrial raw materials. Not surprisingly, the way of life that requires such large amounts of natural resources also produces enormous amounts of wastes in the solid state. But until recently, Americans were not greatly concerned with environmental problems associated with the collection and disposal of trash, garbage, or other solid wastes. In a vast country, with low population density and seemingly unlimited natural resources, the most convenient disposal method—usually an open dump—seemed adequate. There appeared no reason to reuse wastes since virgin materials were abundant and often cheaper than reclaimed materials.

Today, however, this view has been replaced by a genuine concern, not only for improved disposal methods but for the recovery and reuse of the valuable and often irreplaceable resources that form a large part of the discards of this high-production, high-consumption society.

The solid wastes produced in the United States now total 4.3 billion tons a year. Of this, 360 million tons are household, municipal, and industrial wastes. In addition there are 2.3 billion tons of agricultural wastes and 1.7 billion tons of mineral wastes.

Of this annual total 190 million tons, or 5.3 pounds per person per day, are picked up by some collection agency and hauled away for disposal —at a cost of over $4.5 billion per year.

Most present disposal methods pollute either land, air, or water. Three-fourths of the dumps contribute to air pollution and half of them are

so situated
of rivers a
cinerators
needs and

A nation
6 percent
minimum
and all ov
convenient
seeking ne
they can h
the cities,
results in v
rats and ac

By 198
will mount
or 8 poun
in fact, tha
creasing a
increase.

America
waste load
ring their
air; in the
way out t
in the ov
sidewalks
graveyards

The an
cans, 26 b
plastic, 7.
and truck
problems
widesprea
posable c
terials tha

While accounting for only 7 percent of the world's population, Americans consume nearly half of the earth's industrial raw materials. Not surprisingly, the way of life that requires such large amounts of natural resources also produces enormous amounts of wastes in the solid state. But until recently, Americans were not greatly concerned with environmental problems associated with the collection and disposal of trash, garbage, or other solid wastes. In a vast country, with low population density and seemingly unlimited natural resources, the most convenient disposal method—usually an open dump—seemed adequate. There appeared no reason to reuse wastes since virgin materials were abundant and often cheaper than reclaimed materials.

Today, however, this view has been replaced by a genuine concern, not only for improved disposal methods but for the recovery and reuse of the valuable and often irreplaceable resources that form a large part of the discards of this high-production, high-consumption society.

The solid wastes produced in the United States now total 4.3 billion tons a year. Of this, 360 million tons are household, municipal, and industrial wastes. In addition there are 2.3 billion tons of agricultural wastes and 1.7 billion tons of mineral wastes.

Of this annual total 190 million tons, or 5.3 pounds per person per day, are picked up by some collection agency and hauled away for disposal —at a cost of over $4.5 billion per year.

Most present disposal methods pollute either land, air, or water. Three-fourths of the dumps contribute to air pollution and half of them are so situated that their drainage aggravates pollution of rivers and streams. Almost all municipal incinerators are obsolescent in terms of today's needs and technology.

A national survey has revealed that less than 6 percent of 12,000 land disposal sites meet the minimum federal standards for sanitary landfills; and all over the country, cities, unable to find convenient space for land disposal, are desperately seeking new sites—even distant sites—to which they can haul trainloads of municipal wastes. In the cities, all too frequently, inadequate collection results in waste accumulations that breed disease, rats and accidents.

By 1980, it is expected that waste collection will mount to over 340 millions tons per year, or 8 pounds per person per day. It is estimated, in fact, that our solid waste load is presently increasing at twice the rate of the population increase.

Americans see the effect of the present solid waste load everywhere: in smoking dumps that ring their cities and add to the pollution of their air; in the foul-smelling barges that make their way out to sea to dump their cargoes of sludge; in the overflowing garbage cans that line their sidewalks or alleys; in the acres of junked car graveyards that mar their countryside.

The annual "throwaway" includes 48 billion cans, 26 billion bottles and jars, 4 million tons of plastic, 7.6 million television sets, 7 million cars and trucks and 30 million tons of paper. The problems of disposal have been aggravated by widespread and increasing use of packaging, disposable containers, and other convenience materials that do not burn or decay.

But the environmental pollution, the scenic blight, the waste disposal difficulties are only part of the total problem. The vast quantities of nonrenewable resources, such as ferrous metals, which are permanently lost in the solid waste stream, present a growing and unnecessary economic and resource drain.

Today, a new concept of solid waste management is evolving; it assumes that man can devise a social-technological system that will wisely control the quantity and characteristics of wastes, efficiently collect those that must be removed, creatively recycle those that can be reused, and properly dispose of those that have no further use.

The Solid Waste Disposal Act of 1965 marked the first significant interest by the federal government in management of solid wastes. The act provided for assistance to state and local governments, and others involved in managing solid wastes, by financial grants to demonstrate new technology, technical assistance through research and training and by encouragement of proper planning for state and local solid waste management programs.

The Resource Recovery Act of 1970 amended the legislation to provide a new focus on recycling and recovery of valuable waste materials. Under current legislation, EPA:

- Performs research to find improved methods in all aspects of solid waste management and provides technical assistance to speed the application of new knowledge.

Special emphasis is given to studies to determine means of recovering materials and energy from solid waste; methods of accelerating the reclamation of such materials (by economic incentives and disincentives, subsidies, depletion allowances, federal procurement to develop market demand, etc.); and the feasibility of reducing the amount of solid wastes by changes in product characteristics, production or packaging practices.

- Makes financial grants for the construction and operation of plants or processes for demonstrating new technology.

In the city of Franklin, Ohio, for example, an advanced system for recovery of municipal wastes is being demonstrated. It features a hydropulper, by which solid wastes are processed into slurry form. Heavy materials are ejected and ferrous metals removed for salvage by an electromagnet. Paper fiber is recovered for reuse. An additional step planned involves extraction of glass, with separation into various colors by an optical sorting device. The residue has a relatively high percentage of aluminum, which also may be reclaimed.

- Is developing a comprehensive plan for a system of national disposal sites for storage and disposal of hazardous wastes.

- Provides financial assistance to state and local governments and interstate agencies for the development of resource recovery and solid waste disposal systems and for solid waste management planning. By 1971, 50 state or interstate agencies have used this assistance for developing statewide or regional plans for managing solid wastes.

- Provides training to develop the highly skilled engineers and technicians needed to design, operate, and maintain complex new regional systems.

scenic
nly part
of non-
metals,
d waste
ary eco-

manage-
n devise
ely con-
wastes,
ved, cre-
ed, and
further

marked
eral gov-
The act
l govern-
ng solid
rate new
research
f proper
manage-

amended
on recy-
materials.

methods
and pro-
applica-

to deter-
nd energy
ating the

reclamation of such materials (by economic incentives and disincentives, subsidies, depletion allowances, federal procurement to develop market demand, etc.); and the feasibility of reducing the amount of solid wastes by changes in product characteristics, production or packaging practices.

- Makes financial grants for the construction and operation of plants or processes for demonstrating new technology.

In the city of Franklin, Ohio, for example, an advanced system for recovery of municipal wastes is being demonstrated. It features a hydropulper, by which solid wastes are processed into slurry form. Heavy materials are ejected and ferrous metals removed for salvage by an electromagnet. Paper fiber is recovered for reuse. An additional step planned involves extraction of glass, with separation into various colors by an optical sorting device. The residue has a relatively high percentage of aluminum, which also may be reclaimed.

- Is developing a comprehensive plan for a system of national disposal sites for storage and disposal of hazardous wastes.
- Provides financial assistance to state and local governments and interstate agencies for the development of resource recovery and solid waste disposal systems and for solid waste management planning. By 1971, 50 state or interstate agencies have used this assistance for developing statewide or regional plans for managing solid wastes.
- Provides training to develop the highly skilled engineers and technicians needed to design, operate, and maintain complex new regional systems.

solid waste management

Throughout his history, man has been exposed to cosmic and other naturally-occurring radiation. This natural background radiation still constitutes about 55 percent of the total radiation dose reaching the average American each year. The remainder comes from a variety of man-made radiation sources, including x-rays, the operating of nuclear power plants, and electronic devices in the home and workplace.

The potential benefits of successful application of nuclear and electro-magnetic technology are tremendous. However, since radiation can cause cancer or other injury to the body, and since the degree of risk is assumed to vary in direct proportion to the level of exposure, society has a responsibility to keep man-made exposures as low as possible.

Radiation generally classed as "environmental" is only a part of the problem. Levels far higher than are present in the environment today reach increasing numbers of people from "non-environmetal" sources. Medical uses of radiation, for example, now represent about 94 percent of all exposure to man-made radiation, or roughly 40 percent of all radiation sources to which the average person is exposed. Moreover, the last few years have brought increasing application of radiation in research and industrial processing as well as a phenomenal growth in the use of radiation-generating electronic products in the home and workplace.

As a source of environmental radiation, the use of nuclear energy to generate electric power has become an increasing focus of concern. Some 20 nuclear power pl
United States, an
in use by the yea
tion are released
reactors and fro
emissions constit
all man-made ra
sons living near t
since any increas
accompanied by
exposures cannot

The possibilit
amounts of radi
also cannot be d
been stressed si
nuclear power in
tremely remote.

The disposal o
power generatio
lem which may
growth of the n
wastes are buri
sites and a clos
that leakage do
cubic feet of sol
ity are interred
Some 80 million
wastes are in
through newly
reduce their vo
form.

Fallout from
atmospheric nuc
tributes about 3
tion to which A

Throughout his history, man has been exposed to cosmic and other naturally-occurring radiation. This natural background radiation still constitutes about 55 percent of the total radiation dose reaching the average American each year. The remainder comes from a variety of man-made radiation sources, including x-rays, the operating of nuclear power plants, and electronic devices in the home and workplace.

The potential benefits of successful application of nuclear and electro-magnetic technology are tremendous. However, since radiation can cause cancer or other injury to the body, and since the degree of risk is assumed to vary in direct proportion to the level of exposure, society has a responsibility to keep man-made exposures as low as possible.

Radiation generally classed as "environmental" is only a part of the problem. Levels far higher than are present in the environment today reach increasing numbers of people from "non-environmetal" sources. Medical uses of radiation, for example, now represent about 94 percent of all exposure to man-made radiation, or roughly 40 percent of all radiation sources to which the average person is exposed. Moreover, the last few years have brought increasing application of radiation in research and industrial processing as well as a phenomenal growth in the use of radiation-generating electronic products in the home and workplace.

As a source of environmental radiation, the use of nuclear energy to generate electric power has become an increasing focus of concern. Some 20 nuclear power plants are now in operation in the United States, and about 450 are expected to be in use by the year 1990. Small amounts of radiation are released into the environment from these reactors and from fuel reprocessing plants. These emissions constitute only about .003 percent of all man-made radiation to which even those persons living near the plants are exposed. However, since any increase in radiation is believed to be accompanied by increased risk, even low-level exposures cannot be ignored.

The possibility of accidental release of large amounts of radioactivity from nuclear reactors also cannot be dismissed, even though safety has been stressed since the very inception of the nuclear power industry to make this possibility extremely remote.

The disposal of radioactive wastes from nuclear power generation and fuel reprocessing is a problem which may be expected to increase with the growth of the nuclear industry. At present, such wastes are buried or stored at carefully selected sites and a close watch is maintained to assure that leakage does not occur. About two million cubic feet of solid wastes of low-level radioactivity are interred in authorized burial grounds. Some 80 million gallons of stored high-level liquid wastes are in the process of being solidified through newly developed technology which will reduce their volume to one-tenth of the liquid form.

Fallout from weapons-testing prior to the 1963 atmospheric nuclear test ban treaty currently contributes about 3 percent of the man-made radiation to which Americans are exposed.

Health effects which may result from exposure to relatively large doses of ionizing radiation are well known: leukemia and other types of cancer, reduction in fertility, cataracts and other eye damage, acceleration of the aging process, and damage to reproductive cells. There is little understanding, however, of the long-term effects from repeated exposure to all forms of radiation at low-levels. A major potential hazard is damage to, or alteration of, human genes, since natural background radiation is believed to be one of the causes of natural mutation. It must be recognized, therefore, that the protracted release of even very low levels of long-lasting radioactivity from an increasing number of man-made sources has implications for human health which science has barely begun to explore.

The hazards associated with radiation, unlike those of other environmental pollutants, were dramatically illustrated long before widespread commercial application of radiation-producing technology took place. Strict governmental controls were imposed early, therefore, and the formal procedures and scientific bases for establishing and enforcing standards for protection against ionizing radiation have been the most comprehensive of any applied to environmental stresses. Even so, recent federal actions have been aimed at making doubly sure that the utmost precautions are observed:

- Under the reorganization plan establishing the United States Environmental Protection Agency, EPA assumed federal authority to set generally applicable environmental radiation standards. The Atomic Energy Commision (AEC) retains authority to implement and enforce EPA standards in the regulation of radioactive materials and nuclear facilities.
- When EPA was established a comprehensive review of existing radiation standards was underway to determine their adequacy. EPA, in cooperation with the U.S. Department of Health, Education, and Welfare, the Atomic Energy Commission and other Federal agencies, has continued the review, and it is scheduled for completion in 1972.
- Radioactive emissions from nuclear power reactors have constituted only a small fraction of the limits permitted under the radiation control standards which, as mentioned, are currently being reviewed. In 1971, in order to hold such emissions to the "lowest practicable levels," the AEC proposed new design and operating guidelines aimed at limiting emissions to 1/100th of the levels permitted under the standards.
- Under the provisions of the National Environmental Policy Act, EPA reviews all proposals of the Atomic Energy Commission which involve the siting, construction, and operation of nuclear facilities.
- EPA conducts research on the health impact of radiation from all sources, and monitors radiation in the environment.

Federal authorities have developed and have in partial operation an improved state-federal-industry system for monitoring environmental radiation sources to provide improved surveillance capability as the nuclear power industry expands.

om exposure
radiation are
es of cancer,
l other eye
process, and
little under-
effects from
radiation at
d is damage
since natural
e one of the
e recognized,
of even very
ity from an
rces has im-
science has

ation, unlike
utants, were
widespread
on-producing
nmental con-
re, and the
es for estab-
r protection
en the most
nvironmental
ns have been
e utmost pre-

establishing
Protection
hority to set
al radiation

standards. The Atomic Energy Commision (AEC) retains authority to implement and enforce EPA standards in the regulation of radioactive materials and nuclear facilities.

- When EPA was established a comprehensive review of existing radiation standards was underway to determine their adequacy. EPA, in cooperation with the U.S. Department of Health, Education, and Welfare, the Atomic Energy Commission and other Federal agencies, has continued the review, and it is scheduled for completion in 1972.

- Radioactive emissions from nuclear power reactors have constituted only a small fraction of the limits permitted under the radiation control standards which, as mentioned, are currently being reviewed. In 1971, in order to hold such emissions to the "lowest practicable levels," the AEC proposed new design and operating guidelines aimed at limiting emissions to 1/100th of the levels permitted under the standards.

- Under the provisions of the National Environmental Policy Act, EPA reviews all proposals of the Atomic Energy Commission which involve the siting, construction, and operation of nuclear facilities.

- EPA conducts research on the health impact of radiation from all sources, and monitors radiation in the environment.

Federal authorities have developed and have in partial operation an improved state-federal-industry system for monitoring environmental radiation sources to provide improved surveillance capability as the nuclear power industry expands.

radiation

pesticides

Use of chemicals to control pests has long been practiced in the United States. Decades ago, insects causing harm to agricultural crops were dusted with arsenical compounds or sulphurs, and insects that carried human disease or were regarded as nuisances were fought with sprays of light oils and pyrethrins.

Subsequently, synthetic, organic compounds were developed that effectively killed many insect pests long after the time of application. Other chemicals—the herbicides—regulated the growth of broadleaf plants, still others controlled fungus of many types.

Over the years, several hundred basic chemicals have been created and marketed in thousands of formulations to control unwanted insects, plants, fungus growth, soil nematodes, small mammals, and other pests. Not only were agricultural lands treated but homes, gardens, and turf were also covered liberally. The total tonnage of all liquids, granules, and powders rose to the hundreds of thousands and thousands of uses were devised.

The benefits, in terms of increased food production and the control of such killing diseases as malaria and encephalitis all over the world were real and apparent. However, knowledge of the possible side effects of such chemicals entering the environment came more slowly. ,

By 1944, research had shown that the first chlorinated hydrocarbon compounds such as DDT must be classed as killers of fish. By 1948, their ability to accumulate in fatty tissues became apparent.

It is now known that some of the more persistent compounds are present in the tissues of birds, fish, and other wildlife and man as well. A concentrating effect takes place as one species feeds on another and passes the pesticide from one link to another in the food chain. Hence, certain predator birds, fish, or animals may accumulate levels several thousand times the concentration in their environment.

Man, of course, is at the top of this food chain, and the average American now carries about 12 parts per million of DDT in his fatty tissues. There is no direct evidence that this concentration has a harmful effect on humans. However, there is evidence that concentrated pesticide residues have adverse effects on reproduction, physiology, and behavior in some birds and may threaten the survival of certain desirable species of wildlife.

The oceans are a final accumulation site for many of the persistent chlorinated hydrocarbons. One quarter of the world's entire production of DDT may have been transferred to the sea by now, accordin
effects on th
demonstrated.
contaminated
cides, and dec
and oysters in
rectly traceabl

Newer type
organophospha
but more toxi
accidental kills
use of various
200 human
cases of severe

Ironically, t
trol on the s
we may well
insect enemy
for adaptation
sect species, i
human disease
pesticides wh
They are th
chemical trea
dilemma will
ment of safer
tions, althoug
well, the deve
disease contro

Perhaps no
more clearly
tions that tak
and the cautio
that beneficia
of the system
another.

covered liberally. The total tonnage of all liquids, granules, and powders rose to the hundreds of thousands and thousands of uses were devised.

The benefits, in terms of increased food production and the control of such killing diseases as malaria and encephalitis all over the world were real and apparent. However, knowledge of the possible side effects of such chemicals entering the environment came more slowly. ,

By 1944, research had shown that the first chlorinated hydrocarbon compounds such as DDT must be classed as killers of fish. By 1948, their ability to accumulate in fatty tissues became apparent.

It is now known that some of the more persistent compounds are present in the tissues of birds, fish, and other wildlife and man as well. A concentrating effect takes place as one species feeds on another and passes the pesticide from one link to another in the food chain. Hence, certain predator birds, fish, or animals may accumulate levels several thousand times the concentration in their environment.

Man, of course, is at the top of this food chain, and the average American now carries about 12 parts per million of DDT in his fatty tissues. There is no direct evidence that this concentration has a harmful effect on humans. However, there is evidence that concentrated pesticide residues have adverse effects on reproduction, physiology, and behavior in some birds and may threaten the survival of certain desirable species of wildlife.

The oceans are a final accumulation site for many of the persistent chlorinated hydrocarbons. One quarter of the world's entire production of DDT may have been transferred to the sea by now, according to some estimates. Some of its effects on the marine environment have been demonstrated. Marine fish are almost universally contaminated with residues of the persistent pesticides, and declining production of shrimp, crabs, and oysters in certain areas is believed to be directly traceable to pesticide contamination.

Newer types of chemical families include the organophosphates and carbamates. Less persistent but more toxic, these have been responsible for accidental kills of both wildlife and humans. Misuse of various pesticides is implicated in up to 200 human deaths per year and thousands of cases of severe illness.

Ironically, by relying too heavily for pest control on the strategy of chemical extermination, we may well have played into the hands of the insect enemy itself, with its tremendous capacity for adaptation and survival. More and more insect species, including some of those that carry human disease, have developed immunity to the pesticides which had kept them under control. They are thriving again, impervious to such chemical treatment. The answer to our present dilemma will not be found solely in the development of safer more selective chemical formulations, although this is important. It requires, as well, the development of alternative strategies for disease control and crop protection.

Perhaps no environmental problem illustrates more clearly than this one the complex ntractions that take place throughout the ecosystem, and the caution that must be exercised to be sure that beneficial changes made by man in ore part of the system do not create serious damage in another.

The United States Environmental Protection Agency now exercises the principal regulatory and research functions of the federal government over pesticides under authorities contained in the Federal Insecticide, Fungicide, and Rodenticide Act of 1947, as amended; Section 403(d) of the Federal Food, Drug, and Cosmetic Act, as amended; and other laws.

In brief, the salient points of the Federal program are:

registration and labelling

• Manufacturers must apply to EPA for registration of any insecticide herbicide, fungicide, or similar economic poison that will move in interstate commerce. Such chemicals cannot be approved for sale unless the maker provides scientific evidence that his product is effective for the purpose intended and will not injure human beings, livestock, crops, or wildlife when used as directed. Labelling must show the types and amounts of ingredients, method of application, and precautions to be observed.

EPA continuously reviews registered chemicals in light of developing scientific data to insure continued compliance with requirements for safety and efficacy. EPA inspectors collect samples for laboratory analysis. Field checks are performed periodically to confirm the effectiveness of the compound. Pharmacological tests are made to insure that safety precautions shown on the label are adequate.

• EPA may immediately *suspend* the registration of any pesticide product, thus effectively terminating any further interstate shipments if such action is found to be necessary to prevent "imminent hazard to the public."

• Where "imminent hazard" does not exist, EPA may commence action to terminate a registration by issuing *a notice of cancellation* to become effective after 30 days. If the cancellation is challenged, extensive review procedures are required. During this period the product registration remains valid and interstate marketing may continue.

Cancellations and suspension covering certain uses of DDT, aldrin, dieldrin, and the herbicide 2,4,5-T, initiated by the Secretary of Agriculture prior to the establishment of EPA are now final.

Notices of cancellation covering remaining uses of these chemicals—as well as of mirex, a compound used to control the fire ant—have been issued and the review procedures initiated. Final determinations with regard to continued use of these products may be expected early in 1972.

EPA is a
intensive rev
taining benze
endrin, hepta
as well as
arsenic, or le

safe toleran

• EPA es
a "safe tolera
that may be
to protect th
Administratio
tion, and W
foods in inte
tions, and se
ing the esta
offenders.

research an

• EPA c
aspects of p
Primate Rese
seeks to dete
pesticides on
designed to
exposure to
human health
wildlife are c
Breeze Labor
air, and wate
and pathways

technical as

• Technic
cies to strengt

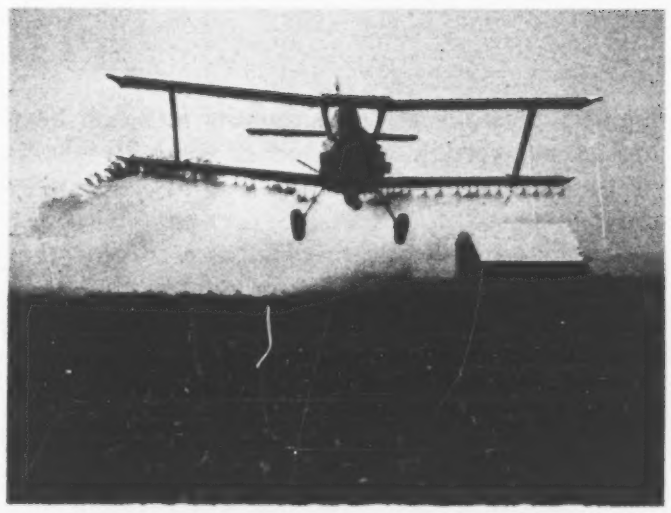
ental Protection
cipal regulatory
eral government
contained in the
nd Rodenticide
n 403(d) of the
metic Act, as

he Federal pro-

EPA for regis-
c, fungicide, or
move in inter-
cannot be ap-
provides scien-
effective for the
injure human
e when used as
the types and
of application,

tered chemicals
data to insure
ments for safety
ect samples for
are performed
tiveness of the
are made to in-
n on the label

nd the registra-
effectively ter-
ipments if such
prevent "immi-



nent hazard to the public."

• Where "imminent hazard" does not exist, EPA may commence action to terminate a registration by issuing *a notice of cancellation* to become effective after 30 days. If the cancellation is challenged, extensive review procedures are required. During this period the product registration remains valid and interstate marketing may continue.

Cancellations and suspension covering certain uses of DDT, aldrin, dieldrin, and the herbicide 2,4,5-T, initiated by the Secretary of Agriculture prior to the establishment of EPA are now final.

Notices of cancellation covering remaining uses of these chemicals—as well as of mirex, a compound used to control the fire ant—have been issued and the review procedures initiated. Final determinations with regard to continued use of these products may be expected early in 1972.

EPA is also carrying out within the Agency, intensive review of registrations of products, containing benzene hexachloride, lindane, chlordane, endrin, heptachlor, and toxaphene, among others, as well as all products containing mercury, arsenic, or lead.

safe tolerances on foods

• EPA establishes for each registered pesticide a "safe tolerance"—that is, the amount of residue that may be safely permitted on raw food crops—to protect the public health. The Food and Drug Administration, Department of Health, Education, and Welfare, enforces these tolerances for foods in interstate commerce by regular inspections, and seizure or recall of shipments exceeding the established limits and prosecution of offenders.

research and monitoring

• EPA conducts extensive research on all aspects of pesticides in the environment. At its Primate Research Facility, in Perrine, Florida, it seeks to determine more precisely the effects of pesticides on man. Various community studies are designed to provide a picture of total human exposure to such chemicals and their effects on human health. Studies of the effects on fish and wildlife are carried out, particularly at the Gulf Breeze Laboratory in Florida. Monitoring of soil, air, and water provides knowledge of the levels and pathways of pesticide contamination.

technical assistance

• Technical assistance is given to State agencies to strengthen their pesticide control programs.

noise

In the United States, we are beginning to realize that man should not tolerate indefinitely the increasing noise that presently characterizes the modern, industrialized nation. Mechanically-generated noise—from the jet plane, the power mower, the diesel truck, the motorcycle, the jackhammer—is a profound annoyance to most people. It has increased dramatically in volume in the last 30 years and continues to rise in urban areas at a rate estimated at one decibel per annum.

It has been clearly demonstrated that workers in certain occupations suffer noise-induced hearing loss. The effects of community noise on hearing are not yet known. However some 20 percent of the United States population, in addition to those exposed to excessive occupational noise, suffer measurable hearing impairment by their fifties, whereas people in non-industrial societies experience no such loss.

Hearing loss is not the only potential health problem associated with noise. Evidence is growing that intense noise may affect other psychologic and physiologic functions of man.

We have tended in the past to accept noise as a phenomenon essentially beyond control. As a result, we have failed to take full advantage of the many noise suppression techniques that are available.

The technology to curb noise from construction equipment, railroad equipment, cars, trucks, and buses exists today. Much can be done to reduce noise associated with aircraft. Auto tires can be made with non-squeal treads. Silence can be designed into machinery for the home, office and factory at reasonable cost. And there is no mystery about constructing sound-proof buildings of all kinds.

In accordance with the Noise Abatement and Control Act of 1970:

- EPA has set up an office of Noise Abatement and Control to evaluate health hazards to the extent possible, summarize the state-of-the-art in noise suppression technology, and recommend a program of counter-measures to Congress not later than December 31, 1971.
- Public hearings have been held in various parts of the country to determine the extent of the problem and identify required control measures.

ing loss. The effects of community noise on hearing are not yet known. However some 20 percent of the United States population, in addition to those exposed to excessive occupational noise, suffer measurable hearing impairment by their fifties, whereas people in non-industrial societies experience no such loss.

Hearing loss is not the only potential health problem associated with noise. Evidence is growing that intense noise may affect other psychologic and physiologic functions of man.

We have tended in the past to accept noise as a phenomenon essentially beyond control. As a result, we have failed to take full advantage of the many noise suppression techniques that are available.

The technology to curb noise from construction equipment, railroad equipment, cars, trucks, and buses exists today. Much can be done to reduce noise associated with aircraft. Auto tires can be made with non-squeal treads. Silence can be designed into machinery for the home, office and factory at reasonable cost. And there is no mystery about constructing sound-proof buildings of all kinds.

In accordance with the Noise Abatement and Control Act of 1970:

- EPA has set up an office of Noise Abatement and Control to evaluate health hazards to the extent possible, summarize the state-of-the-art in noise suppression technology, and recommend a program of counter-measures to Congress not later than December 31, 1971.
- Public hearings have been held in various parts of the country to determine the extent of the problem and identify required control measures.

Photos by: Elliott Erwitt, Magnum, cover; Nelson Morris, Photo Researchers, inside front cover; Katrina Thomas, 3; EPA, 4, top; Robert McBride, 4, right; Peggy Miller, Pix, 4, left; Thomas E. Evans, Photo Researchers, 4, lower right; J. Alex Langley, 4, center; National Bureau of Standards, 4, lower center; Burk Uzzle, Magnum, 5; Robert McBride, 6; Tom McHugh, Photo Researchers, 7; Burt Glinn, Magnum, 9; Susan McCartney, Photo Researchers, 10; Russ Lamb, Photo Researchers, 12; Pierre Berger. Photo Researchers, 13; John Neubauer, 15, left; EPA, 15, right; George Scherventer, National Park Service, 16; Darwin Van Campen, Western Ways, 17; Burk Uzzle. Magnum, 18; Dennis Stock. Magnum, 19; EPA, 20; Burk Uzzle, Magnum, 23; Roger Malloch, Magnum, 24; Rene Burri, Magnum, inside back cover.

☆U.S. GOVERNMENT PRINTING OFFICE: 1971-0—443-062

on-going programs

On-going programs transferred to EPA under the President's Reorganization Plan No. 3 included the functions of:

The Federal Water Quality Administration—from the Department of Interior

The National Air Pollution Control Administration

The Bureau of Solid Waste Management

The Bureau of Water Hygiene

The Bureau of Radiological Health (environmental radiation programs)
—from the Department of Health, Education, and Welfare

The Federal Radiation Council

Also transferred to EPA were responsibilities and authorities for:

Establishing standards for environmental chemicals—from the Atomic Energy Commission

Establishing tolerances for pesticide chemicals—from the Department of Health, Education, and Welfare

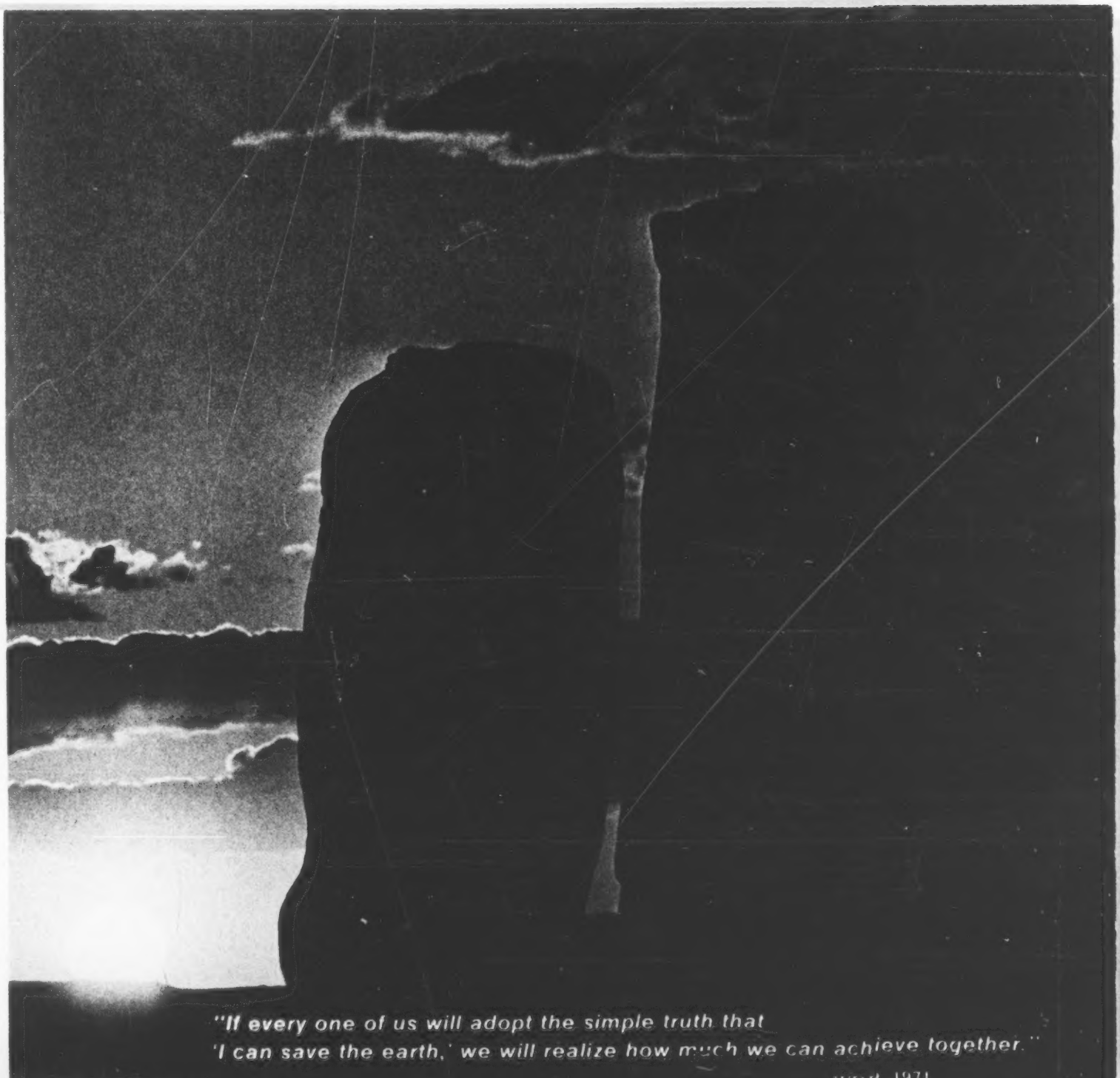
Registration and labeling of pesticides—from the Department of Agriculture

Conducting research on pesticides—from several Departments

Conducting research on ecological systems—from the Council on Environmental Quality

In addition, the Noise Abatement and Control Act of 1970 assigned to EPA the responsibility for studying the problem of noise and making recommendations for control.

"If every one of us will adopt 'I can save the earth,' we will



"If every one of us will adopt the simple truth that
'I can save the earth,' we will realize how much we can achieve together."

WDR 1971

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Regional Offices	Phone	States covered
Boston, Massachusetts 02203	617–223–7210	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
New York, New York 10007	212–264–2525	New Jersey, New York, Puerto Rico, Virgin Islands
Philadelphia, Pa. 19106	215–597–9151	Delaware, Maryland, Pennsylvania, Virginia, West Virginia, D.C.
Atlanta, Georgia 30309	404–526–5727	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee
Chicago, Illinois 60606	312–353–5250	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
Dallas, Texas 75202	214–749–2827	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
Kansas City, Missouri 64106	816–374–5493	Iowa, Kansas, Missouri, Nebraska
Denver, Colorado 80203	303–837–3895	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
San Francisco, Calif. 94102	415–556–4303	Arizona, California, Hawaii, Nevada, American Samoa, Guam, Trust Territories of Pacific Islands, Wake Island
Seattle, Washington 98101	206–442–1200	Alaska, Idaho, Oregon, Washington

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 60 cents
Stock Number 5500-0031

UNITED STATES
ENTAL PROTECTION AGENCY
SHINGTON, D.C. 20460

Phone	States covered
617–223–7210	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
212–264–2525	New Jersey, New York, Puerto Rico, Virgin Islands
215–597–9151	Delaware, Maryland, Pennsylvania, Virginia, West Virginia, D.C.
404–526–5727	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee
312–353–5250	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
214–749–2827	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
816–374–5493	Iowa, Kansas, Missouri, Nebraska
303–837–3895	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
415–556–4303	Arizona, California, Hawaii, Nevada, American Samoa, Guam, Trust Territories of Pacific Islands, Wake Island
206–442–1200	Alaska, Idaho, Oregon, Washington

uperintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 60 cents
Stock Number 5500-0031